

Fighting Food Waste in the Tourism Sector

Challenges and Opportunities for
Latin America, the Caribbean,
and Beyond

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ACRONYMS

AH&LA	American Hotel and Lodging Association
AI	Artificial Intelligence
BAMX	Banco de Alimentos de México
BCG	Boston Consulting Group
BCR	Benefit-Cost Ratio
BUFFET	Building an Understanding for Food Excess in Tourism
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CLIA	Cruise Lines International Association
CO₂e	Carbon Dioxide Equivalent
COGS	Cost of Goods Sold
CSO	Civil Society Organizations
CSR	Corporate Social Responsibility
F&B	Food & Beverage
FAO	Food and Agriculture Organization of the United Nations
FLI	Food Loss Index
FLPC	Food Law and Policy Clinic, Harvard Law School
FUSIONS	Food Use for Social Innovation by Optimising Waste Prevention Strategies
FW	Food Waste
FWI	Food Waste Index
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GSTC	Global Sustainable Tourism Council
HLPE	High-Level Panel of Experts
ICCA	International Congress and Convention Association
LAC	Latin America and the Caribbean

OECD	Organization for Economic Co-operation and Development
PATA	Pacific Asia Travel Association
ReFED	Rethink Food Waste Through Economics and Data
ROI	Return on Investment
SDG	Sustainable Development Goals
SENASA	Spanish acronym for National Service for Agrifood Health and Quality of Argentina
UAB	Spanish acronym for Autonomous University of Barcelona
UK	United Kingdom
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDESA	United Nations Department for Economic and Social Analysis
UNEP	United Nations Environment Programme
UNWTO	United Nations World Tourism Organization
US EPA	United States Environmental Protection Agency
WEF	World Economic Forum
WRAP	Waste and Resources Action Programme
WRI	World Resources Institute
WTTC	World Travel and Tourism Council
WWF	World Wildlife Fund

EXECUTIVE SUMMARY

In a world where 1 in 9 people suffer from hunger, the fact that more than 1 billion tons of food go to waste each year is unacceptable. Now more than ever, **the vast social and economic impacts wrought by the global COVID-19 pandemic have put a spotlight on the interconnected issues of food security and food waste (FW) and the need to address both.**

Food waste occurs throughout the value chain, from the farm to the table. **This report focuses on FW at the consumption stage**, specifically in the tourism sector, with emphasis on Latin America and the Caribbean (LAC).

The COVID-19 pandemic has had a severe impact on the tourism sector—much greater than that of any previous crisis—bringing travel and tourism to a screeching halt. As economies gradually reopen, many hotels, restaurants and other hospitality-related businesses are **implementing health and biosafety protocols to protect their employees, guests, and the community, and are also rethinking their operating models** to adapt to a post-pandemic reality.

Businesses are prioritizing liquidity needs to ensure that they can withstand a recovery that will most likely be slow until better treatment options are identified, and a vaccine is developed. As companies rethink business in a “new normal” there is an **opportunity for tourism players to better integrate sustainability as they rebuild**, including being proactive about FW prevention and management.

The enormity of the food waste problem

The numbers surrounding FW are astonishing. According to the Food and Agriculture Organization of the United Nations (FAO), every year, **one third of all food produced for human consumption is lost or wasted**. This amounts to **1.3 billion tons**, about 180,000 Eiffel Towers’ worth of food, enough to feed 2 billion people. The estimated economic value is of **US\$936 billion**, not including the environmental and social costs. FW also has a deep carbon footprint of 3.3 Gigatons, about **8% of global carbon emissions**. By 2030, FW is expected to increase by 60 percent, resulting in a loss of over US\$1.5 trillion. It is not surprising that this challenge has its own target within the Sustainable Development Goals (SDG 12: Sustainable Consumption and Production), **aiming to cut global FW in half by 2030**.

While FW is a global problem, there are significant differences across regions. **In developing countries, most losses occur in the production, handling, and storage phases of the food value chain**. For example, LAC, one of the world’s primary breadbaskets, is responsible for 10% of global FW (127 million tons), in part due to weak infrastructure and poorly organized value chains. In contrast, in developed countries FW occurs primarily in the final consumption stage. Since value is added to food as it moves through the value chain from production to consumption (i.e., from rice in the field to risotto served in a restaurant), the **economic cost of FW is highest at the final consumption stage**.

Competitive advantages of the tourism sector to tackle food waste

While tourism is confronting many new challenges brought by the coronavirus pandemic, the sector nonetheless offers a number of **competitive advantages** for implementing FW management solutions. These include the huge relevance of the sector in terms of GDP (10% of the world's GDP) and jobs (employs 10% of the global workforce), as well as the steady growth of the industry, which until 2019 had outpaced the global economy growth for nine consecutive years (3.5% vs. 2.5% respectively in 2019). Therefore, **initiatives to address FW have the benefit of being immersed in an economically impactful and highly visible industry.**

In addition, there is **market concentration** when it comes to hotels and cruise lines. For example, four cruise corporations hold 85% of the market and the biggest hotel chain includes almost 7,000 hotels. In turn, market concentration can facilitate **the replication and scalability of good practices in FW management.** Similarly, the tourism industry seems to be better prepared to address FW than other sectors since environmental management plans, certifications, and standards are already commonplace, offering an existing framework through which FW measures can be introduced.

The tourism sector's position at the consumption end of the FW value chain is another good reason for working on FW management. **There is a cumulative and incremental effect on the value of food wasted as the value chain advances.** As a result, throwing away edible food in the consumption phase is more expensive and has a higher environmental footprint. At the same time, working at the consumption level presents the challenge of dispersion, with millions of people wasting smaller amounts of food. Fortunately, the sector's geographic concentration of FW in big cruises, resorts, and tourist hubs facilitates economies of scale in implementing FW measures.

Finally, the tourism sector offers **conducive conditions for behavioral change in terms of both consumers and businesses.** Tourists are already familiar with other hotel sustainability efforts (saving water, reusing towels, reducing single-use plastics) and consumers are increasingly aware of the FW problem. This awareness coupled with the importance of customer reviews for influencing tourists' decision-making can incentivize companies to address issues such as FW that could tarnish (or bolster) their image.

Business benefits of addressing food waste

From a bottom line perspective, it makes economic sense to invest in FW management. This is especially true in an operating environment that is still in recovery mode with reduced revenues and that is avidly trying to identify creative solutions to reduce expenses to improve operating margins. A Champions 12.3 study found that a sample of 42 hotels had, on average, a return of US\$7 for each US\$1 invested in FW management during a three-year time frame, demonstrating **a clear opportunity for cost savings.**

Tourism companies can also create social and economic value by repurposing FW. This can mean redirecting FW towards other productive uses such as animal feed or compost.

Surplus food can also be recovered and donated to people in need through food banking. Finally, companies stand to gain **from reputational returns and improved stakeholder engagement** by addressing FW. Incorporating FW reduction measures into broader sustainability strategies and reporting is one way for companies to show they are taking tangible action on issues that matter to stakeholders, from employees and customers to shareholders and investors. This would not only help tourism sector companies to attract and retain talent, but also to build brand trust in the market

The roles of other actors in promoting food waste management

There are complementary roles that different stakeholders can play in helping the tourism sector reduce FW. To start, **governments should develop regulatory and legal frameworks** that are conducive to the implementation of FW management measures, as well as support public-private coordination, research, and working groups to elevate the issue.

The private sector, too, plays a crucial role in helping tourism sector businesses reduce FW by developing innovative FW management solutions, from software and equipment to organic waste management services. A growing number of startups and social enterprises are working on FW solutions, in part encouraged by an increasing array of contests, accelerators, and mentorship programs related to FW. Large food corporations are joining the FW innovation race and venture capital investment in FW management-related startups has been rising around the world.

In addition, **civil society organizations** are often the driving force behind efforts to raise awareness about the FW problem and change people's behaviors. **International organizations** and **multilateral development banks (MDBs)** can finance FW programs, generate and share knowledge, promote public policies, and raise awareness on the business case for FW. Tourism associations, such as hotel groups can help increase the visibility of the FW problem, encourage innovation, and create synergies among their members. Finally, **tourists** themselves can make a difference by being aware of FW measures when traveling and promoting FW reduction initiatives.

Given the magnitude of the COVID-19 crisis, it has become clear that the private sector cannot build back the tourism industry alone, and a successful recovery requires significant public sector support. It is therefore an opportune time to engage with governments about the importance of FW and identify public-private initiatives that can enhance the sector's long-term sustainability.

Challenges remain

To take advantage of the opportunity to tackle FW through the tourism sector, certain challenges must be overcome. First and foremost, **there is a lack of sector-specific data on FW. For example, there are no reference values for FW generation per capita for hotels, cruises, or convention centers. Filling this gap is essential to establish a baseline from which to determine and measure sector targets for FW reduction.** In fact, businesses that have started measuring and estimating their FW volumes have realized the potential this has for raising awareness among their staff and setting reduction targets.

Another challenge is the behavioral change that FW management involves, both in terms of client decisions and procedures within organizations. Even though tourists are increasingly demanding more sustainable operations, some may associate FW prevention measures with worsening service quality. The fear of this reaction could stop companies, such as all-inclusive hotels or cruises, from taking further FW prevention measures.

Opportunities for food waste management in LAC

The LAC region offers unique opportunities for reducing FW in the tourism sector. It is home to some of the world's top tourism destinations and major cruise hubs, offering the chance to implement and scale FW measures in tourist dense areas. There are also strong food banking networks across the region which can help encourage more hospitality companies to donate surplus food.

The **entrepreneurial landscape** in LAC has been booming in recent years, with the increasing emergence of tech-driven enterprises aiming to tackle social and environmental challenges. A number of these startups offer FW solutions relevant for the tourism sector, such as **digital platforms and mobile apps** to connect hotels and restaurants which have surplus food with food banks serving people in need. The region also experienced record high levels of venture capital investment in 2019, and impact investing has continued to grow.

There have also been **advancements on the legislation front**, particularly in 2019 with the passing of new FW laws in Colombia and Peru and the drafting of specific FW laws in at least six other countries in the region. Finally, while FW management remains a challenge for the tourism sector, there are a number **of examples of hotels and hospitality businesses already taking action** to confront the problem, which could serve to inform and inspire others to follow suit.

Conclusion

On one hand, the outlook for the tourism sector is stark in the wake of the global COVID-19 pandemic. The World Travel and Tourism Council estimates that in 2020, up to **198 million tourism jobs** are at risk, with a potential loss of up to **US\$5.5 trillion** in GDP.

However, this drastic disruption in tourism activity offers an **opportunity for businesses to take stock and consider FW measures as a way to improve operating margins and redirect the sector's path** towards a more socially inclusive and environmentally sustainable future. As the tourism sector in LAC rebuilds, the region has the opportunity to become a **testing ground** for FW management solutions where lessons can be learned to inform efforts in other areas of the world.

INTRODUCTION

In the wake of the global COVID-19 pandemic, travel and tourism have ground to a halt. The tourism sector, which accounts for 10% of global GDP and 1 in 10 jobs, has been hit extremely hard. Many restaurants, hotels, and other hospitality businesses are struggling to remain solvent in the face of drastically reduced or even zero revenue scenarios, threatening millions of jobs. Even as economies reopen and restrictions are gradually lifted, many people are reluctant to travel.

At the same time, the crisis has put a spotlight on food. It has shown how precarious access to food is in communities across the world and how quickly food can become scarce when supply chains are disrupted and economies forced to shut down. In this context of greater food scarcity, the massive problem of food waste (FW)¹ has gained renewed attention.

While much has changed in the world since this study was initiated in 2019, its focus on the issue of FW in the tourism sector is crucially relevant today. Hotels, cruises, and other tourism sector businesses are rethinking their operating models to adapt to a post-pandemic reality, which offers a fresh opportunity for them to better integrate sustainability as they rebuild. This includes being proactive about reducing FW through both prevention and circular economy approaches to repurpose unavoidable FW. Likewise, it can help advance progress towards the United Nations Sustainable Development Goals (SDGs), which include a specific target for cutting FW in half by 2030.

This study aims to present the challenge of FW in the tourism sector and assess the potential to transform negative impacts into business opportunities as well as positive social and environmental outcomes. The analysis focuses on three tourism subsectors: hotels, cruises, and convention centers. It sheds light on the role that different public and private actors play in tackling this problem and analyzes the opportunities offered by the sector in Latin America and the Caribbean (LAC).

The study consists of two parts. Part 1 provides an overarching picture of the FW problem. Chapter 1 describes the magnitude of FW as well as its economic, social, and environmental impacts. Chapter 2 discusses FW in the context of the global tourism industry, focusing on the three tourism subsectors and how their unique characteristics create both opportunities and challenges for improving FW management. Chapter 3 analyzes the causes of FW in the hospitality sector, as well as its measurement challenges, highlighting the lack of FW data.

Part 2 presents the challenges and opportunities of taking action to reduce FW. Chapter 4 outlines the benefits that businesses can gain through FW management, while Chapter 5 describes the roles of relevant actors and the importance of coordination across this ecosystem in order to tackle the problem holistically. Chapter 6 focuses on LAC, describing the unique opportunities the region offers for reducing FW in the tourism sector. Finally, the Conclusion relates this issue to the post-pandemic reality.

¹ The acronym FW is used interchangeably throughout this report to refer to both “food waste” and “food loss and waste”. For a definition of food loss and food waste see the Glossary in Annex A.

PART I

The Problem

The Food Waste Challenge
within the Tourism Industry



CHAPTER 1

SIZING THE FOOD WASTE PROBLEM

Food waste (FW) is a massive problem. It affects the sustainability of food systems, reduces local and global food availability, decreases farmer income, raises food prices for consumers, impairs human health and nutrition, and harms the environment due to an overuse of natural resources.

According to the Food and Agriculture Organization of the United Nations (FAO) (2011, 2014), every year, one third of all food produced for human consumption is lost or wasted, amounting to 1.3 billion tons². This represents an estimated economic value of US\$936 billion, not including the environmental and social costs (FAO, 2014).

Food waste is food originally meant for human consumption that leaves the human food chain. If it is directed to a non-food use, such as animal feed or bioenergy, it is still considered wasted food.

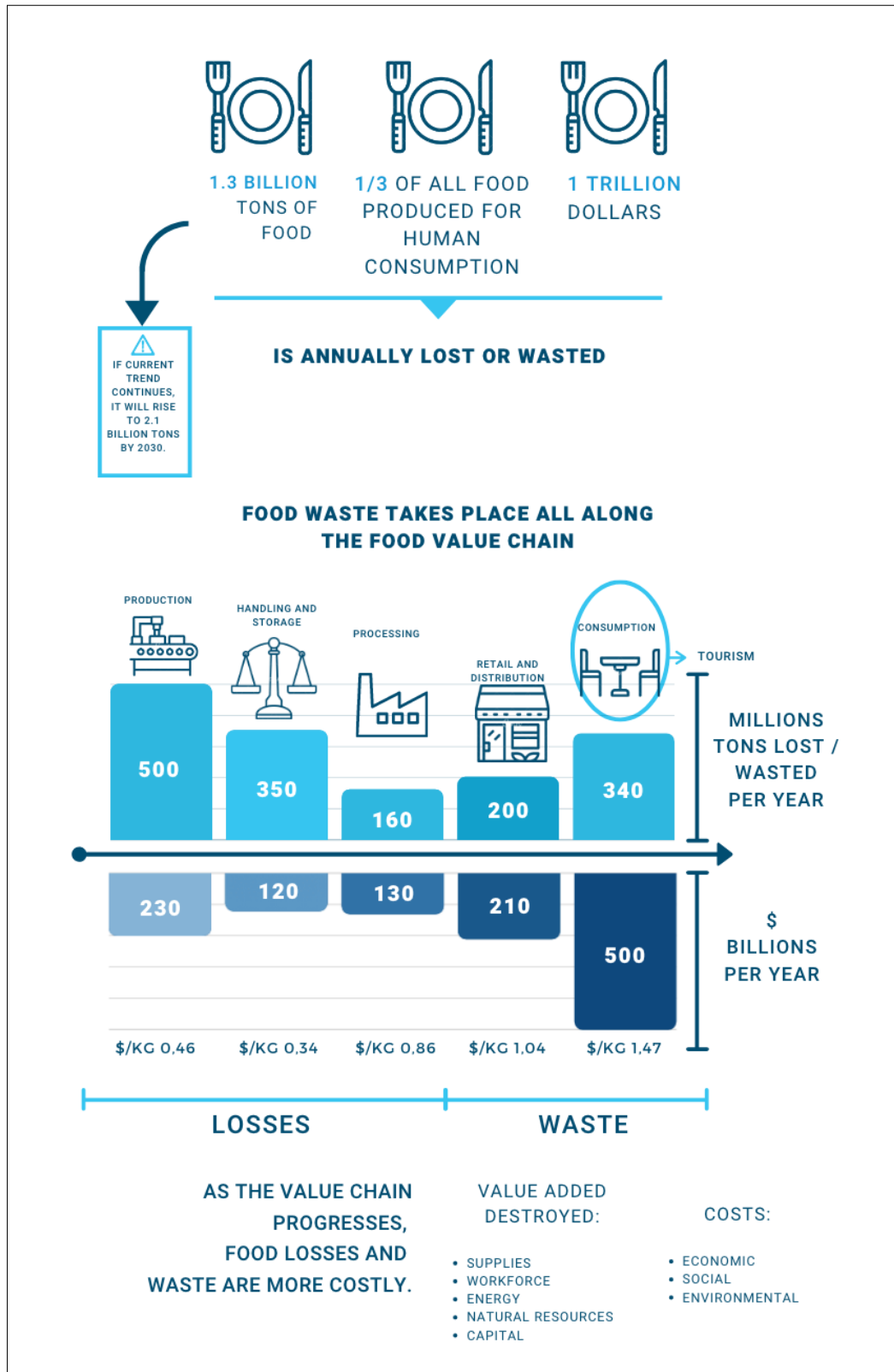
By 2030, FW is expected to increase by 60% (to 2.1 billion tons), resulting in a loss of over US\$1.5 trillion (Boston Consulting Group, 2018). This projected increase is due not only to growth in the amount of FW generated, but also to changes in habits and consumption patterns. For example, developing regions that have experienced a significant increase in economic income are expected to exhibit patterns of higher food waste at the consumption level similar to those already seen in developed countries. In fact, Latin America, Africa, and Asia are expected to experience the highest FW growth rates by 2030.³

As Figure 1 shows, FW occurs at all steps in the value chain. In terms of quantity, it is most noticeable at the beginning (production and handling/storage) and the end (consumption). As we move along the chain from production to consumption, FW becomes costlier in economic, social, and environmental terms, as waste destroys the value added at each stage. For example, wasting risotto at a hotel restaurant in Italy is more costly than losing rice in a field in Vietnam. By the time the rice becomes risotto, it has been harvested, transported, packaged, stored, prepared, and commercialized, making the economic and natural resources invested, as well as the environmental impact generated, much higher.

² Equal to the weight of 180,000 Eiffel towers.

³ By descending order of FW growth rates: South and Southeast Asia (80%); Sub-Saharan Africa (46%); North Africa and Western and Central Asia (40%); China, Japan and South Korea (36%); Latin America (28%); North America and Oceania (8%); Europe and Russia (8%).

Figure 1 | The Food Waste Problem

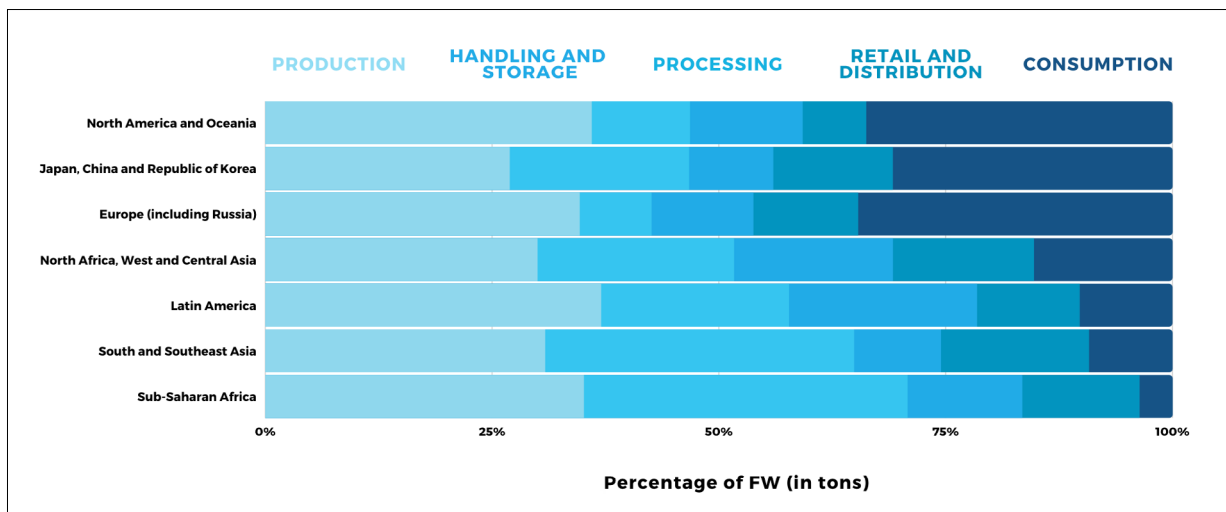


Source: Developed by the authors based on BCG (2018); FAO (2011); and FAO (2014).

Food that was originally meant for human consumption can leave the food value chain at different stages. For example, during production, entire crops can be left unharvested due to low market prices. When crops are transported, food can be spoiled because of high humidity or temperatures. At the industrial level, food can be wasted because of errors in packaging or labeling. Once food arrives at a distribution or retail center, it can be wasted due to expiration dates or damage caused during handling. Finally, at the household level, food can be wasted because it expires, or consumers do not eat all the food they buy or prepare.

While FW is a global problem, there are significant differences across regions (Figure 2). In developing countries, FW is largely concentrated in the production, handling, and storage phases, while in developed countries, it is most prevalent in the consumption phase among both retailers and consumers.

Figure 2 | Distribution of Food Lost and Wasted by Stage and Region



Source: High Level Panel of Experts on Food Security and Nutrition (HLPE, 2014).

Tourism industry players, including hotels, cruises, restaurants, and convention centers, generate FW at the consumption stage. Contributing factors include food purchase errors, waste generated during food preparation, customer leftovers, and overproduction.

Given the cumulative and incremental effect on the environment as well as economic losses when the value chain progresses, the tourism sector is a strategic industry to reduce FW.

There are currently no specific estimates on the volume or economic cost of FW generated by the tourism sector globally or in LAC. However, a report from the United Kingdom (UK) sheds some light on the economic value of food wasted by the sector. According to the Waste and Resources Action Programme (WRAP, 2013), in 2011 the total cost of FW generated within the hospitality sector in the UK was estimated at £317.8 million per year.

Alignment with the Sustainable Development Goals

The challenge of reducing FW throughout the food value chain has gained visibility as a critical global issue. The United Nations Sustainable Development Goals (SDGs) include a specific FW reduction target within SDG 12 (Responsible Consumption and Production). SDG target 12.3 calls for cutting in half per capita global FW at the retail and consumer levels by 2030 and reducing food losses along production and supply chains.

In order to measure progress towards this SDG target and update initial global FW estimates published by FAO in 2011⁴, two new indexes are being developed by FAO and UN Environment, respectively: the Food Loss Index (FLI) and the Food Waste Index (FWI). The FLI covers food lost after harvest and up to, but not including, the retail level, while the FWI covers the retail and consumption (public and household) stages.

Preliminary findings for the FLI released in December 2019 estimate that globally, in terms of economic value, approximately 14% of food produced is lost from post-harvest up to, but not including, the retail level (FAO, 2019a). These new estimates are not directly comparable to the 2011 estimates due to methodological differences. For example, the new estimates do not cover the whole food supply chain. Also, compared to the old estimates, the new FLI statistics do take into account the economic value of the amount lost rather than just the quantity (FAO, 2019a). Preliminary estimates for the FWI, which includes the tourism sector, were still in progress as of the date of publication of this report.

Triple Impact: Economic, Environmental, and Social

Consider all the water, energy, and other resources that go into producing, transporting, processing, and selling food, as well as the emissions and other byproducts generated along the way. When food is lost or wasted, these environmental effects are generated in vain. In addition, disposing of unused food has further environmental impacts (i.e., GHG emissions, water, soil, and air pollution).

Waste of agricultural-livestock land⁵ and other associated natural resources includes the farmland and grassland necessary to produce food that ends up wasted. In 2007, an estimated 3.4 billion acres of land were cultivated to produce food that was never eaten, equivalent to 28% of the world's agricultural area (FAO, 2013).

According to the criteria adopted by FAO⁶ (2015), the global carbon footprint of FW is about 3.3 billion tons of CO₂ equivalents (8% of total global emissions). If it were a country, FW would be the third largest emitter in the world, behind China and the United States (FAO, 2015). And the largest carbon footprint in wasted food is in the consumption phase (37% of the total).

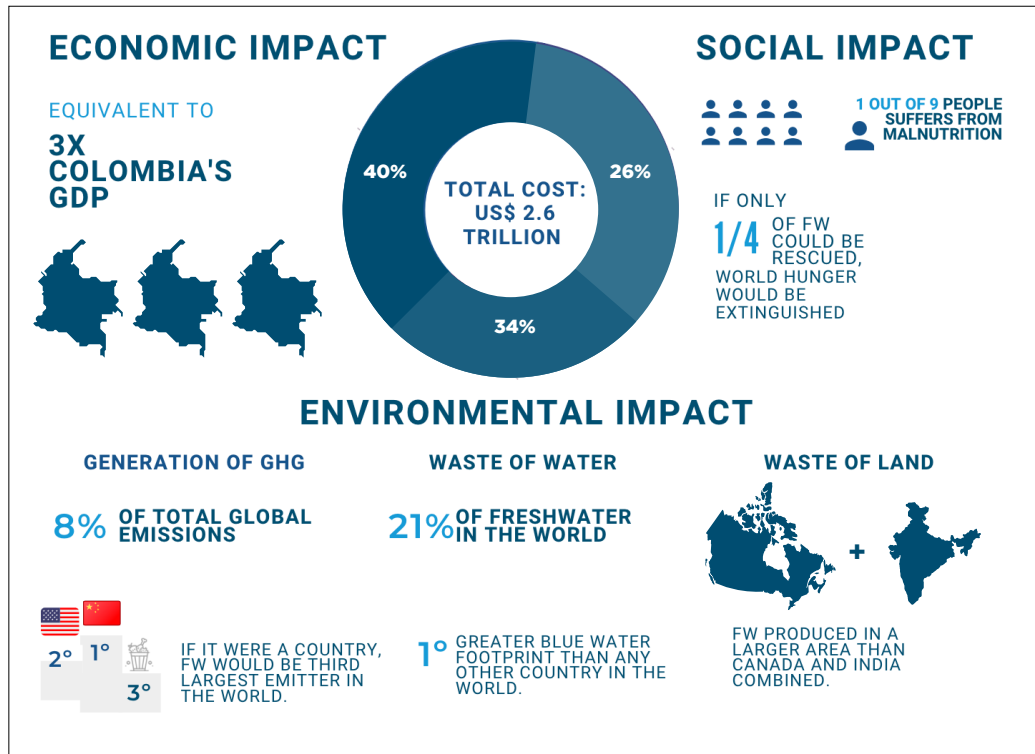
⁴ The widely-cited 2011 global FW estimates were prepared for FAO by the Swedish Institute for Food and Biotechnology.

⁵ This indicator is not enough to describe all environmental impacts related to the earth. In fact, it does not address the issue of change in land use, which would explain the impact of deforestation, urbanization and soil sealing, nor does it indicate whether land occupation is really beneficial or negative for the environment, in particular with regard to impacts on soil quality (FAO, 2013).

⁶ 1 tn. food waste = 2,5 tn. CO₂e

Although it is a complex challenge, FAO (2013, 2014, 2015) has quantified the full economic, environmental, and social costs of FW to be approximately US\$2.6 trillion annually worldwide (Figure 3). This total cost includes the economic loss, i.e. the value of the food products lost and wasted (US\$936 billion annually).

Figure 3 | Food Waste's Triple Impact



Source: FAO (2013); FAO (2014); and FAO (2015).

The environmental dimension includes FW-induced economic losses of approximately US\$696 billion annually (FAO, 2014) caused by greenhouse gas and ammonia emissions, water pollution, deforestation, water use and scarcity⁷, biodiversity loss, soil erosion, land occupation, fisheries overexploitation, and pollinator extinction.

The social costs are estimated at US\$882 billion annually, including livelihood loss, health damage, acute health effects of pesticides, and risk of conflict. Conflicts can occur when there is a shortage of fertile land, as agricultural production can increase soil degradation.

When food is wasted, society will not benefit from the use of the soil and its nutrients (FAO, 2014). If FW is reduced by even 25%, the saved food would be enough to effectively end world hunger, hence contributing to the achievement of SDG 2 (Zero Hunger).

⁷ Irrigating crops that are later wasted not only causes the direct loss of the economic value of the water used, but can also increase water scarcity in the production region, which entails additional economic and social costs.

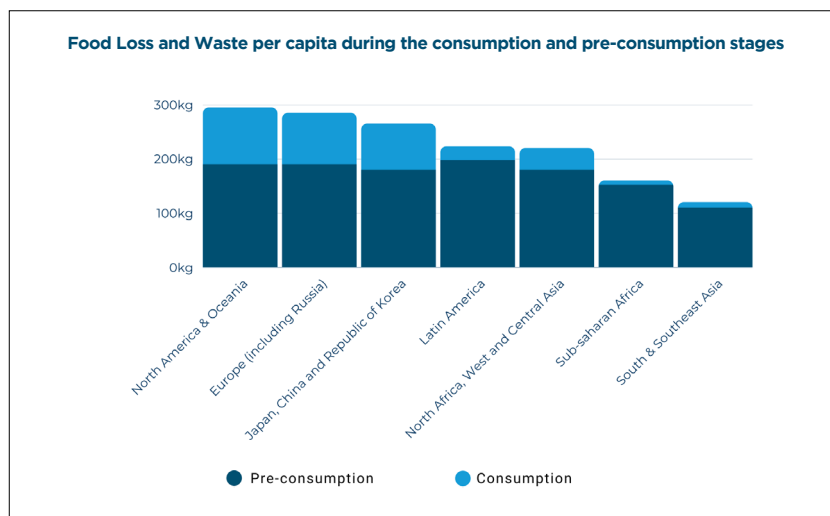
Food Waste in Latin America and the Caribbean

LAC produces more than enough food to feed its entire population, with food production and availability increasing year by year. The region is the world’s largest net food exporter and by 2024, its agricultural trade balance could exceed that of North America (OECD & FAO, 2015).

LAC is responsible for 10% of global FW (in kg), representing approximately 127 million tons, enough to feed about 300 million people (FAO, 2014).

Each year, LAC wastes at least 15% of its available food⁸ (FAO, 2014), mainly due to weak infrastructure and poorly organized value chains. FW occurs in varying amounts during production, handling and storage, processing, distribution, and at the consumer level, translating into approximately 223 kg of food wasted per person per year (FAO, 2011).

Figure 4 | Per Capita Food Waste by Region



Source: FAO (2011).

Note that in LAC, the proportion of FW occurring in the consumption stage is approximately 10% of the total amount generated (in kg), while in more developed regions, such as North America and Oceania, FW at the consumption stage represents a much higher percentage (40%). Therefore, while implementing FW reduction measures is important in every region, efforts should focus on where the problem is most acute: in the consumption phase in developed countries and in the production, handling, storage, and processing stages in LAC.

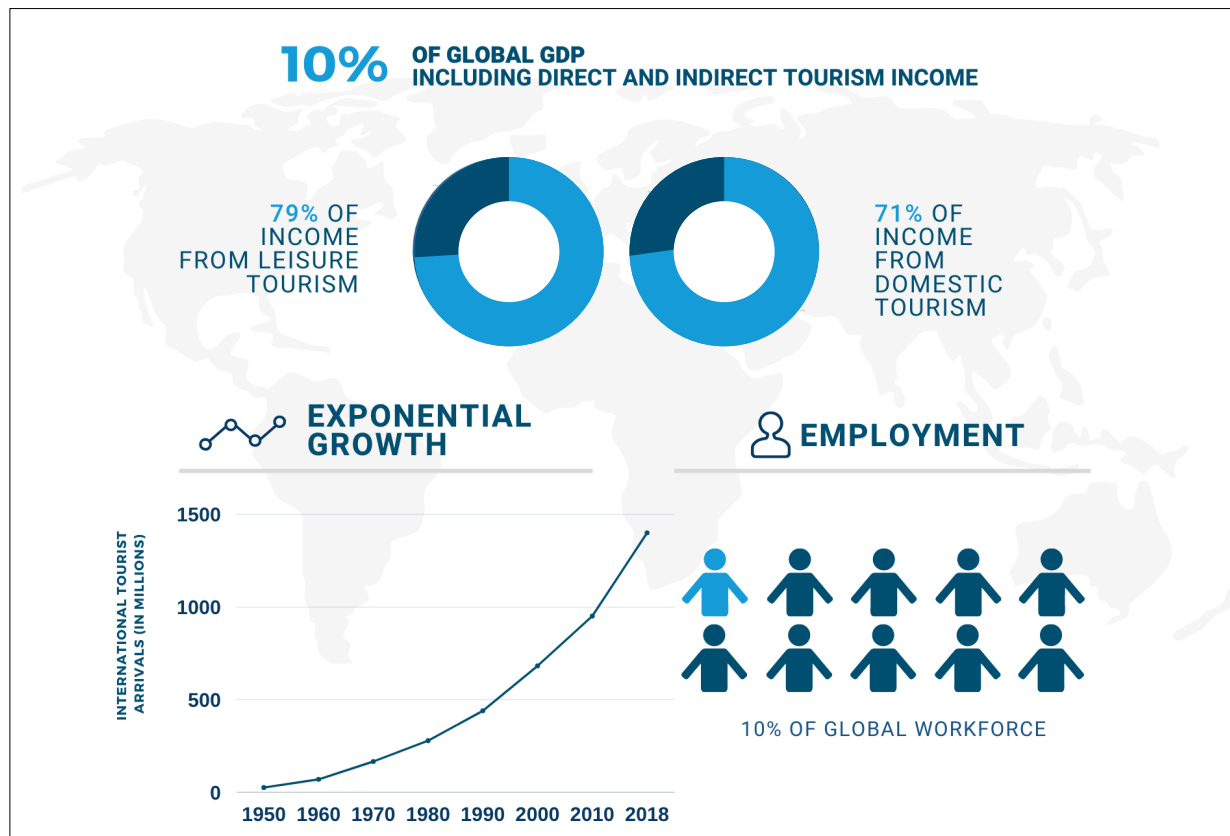
Furthermore, according to FAO (2015), LAC has the fourth highest carbon footprint associated with FW in the world, and the highest in the developing world (540 kg of CO₂e per capita per year). The economic losses are estimated at US\$50 billion. This data not only sheds light on the magnitude of the problem in the region, but also on the potential triple positive impacts that could be achieved if FW were reduced.

⁸ Expressed in kcal.

CHAPTER 2 THE TOURISM INDUSTRY

According to the World Travel and Tourism Council (WTTC), the tourism industry is one of the most profitable sectors globally. Considering direct, indirect, and induced income⁹, tourism contributes to about 10% of global gross domestic product (GDP). International and domestic tourism during 2019 generated total income of US\$8.9 trillion, representing a growth rate of 3.5%, outpacing the global economy growth of 2.5% (WTTC, 2020a). The importance of the tourism industry is also due to its intensive use of human resources since it directly and indirectly employs 10% of the global workforce, generating 330 million jobs (WTTC, 2020a).

Figure 5 | Global Tourism Industry Snapshot (pre-COVID-19)



Source: WTTC (2020a); UNWTO (2011).

According to the United Nations Conference on Trade and Development (UNCTAD) (2010), tourism is one of the five main export earnings in more than 150 countries, while in 60 countries it is the main exporter. It is also the main source of foreign currency exchange for one third of developing countries and half of the least developed countries. Therefore, tourism

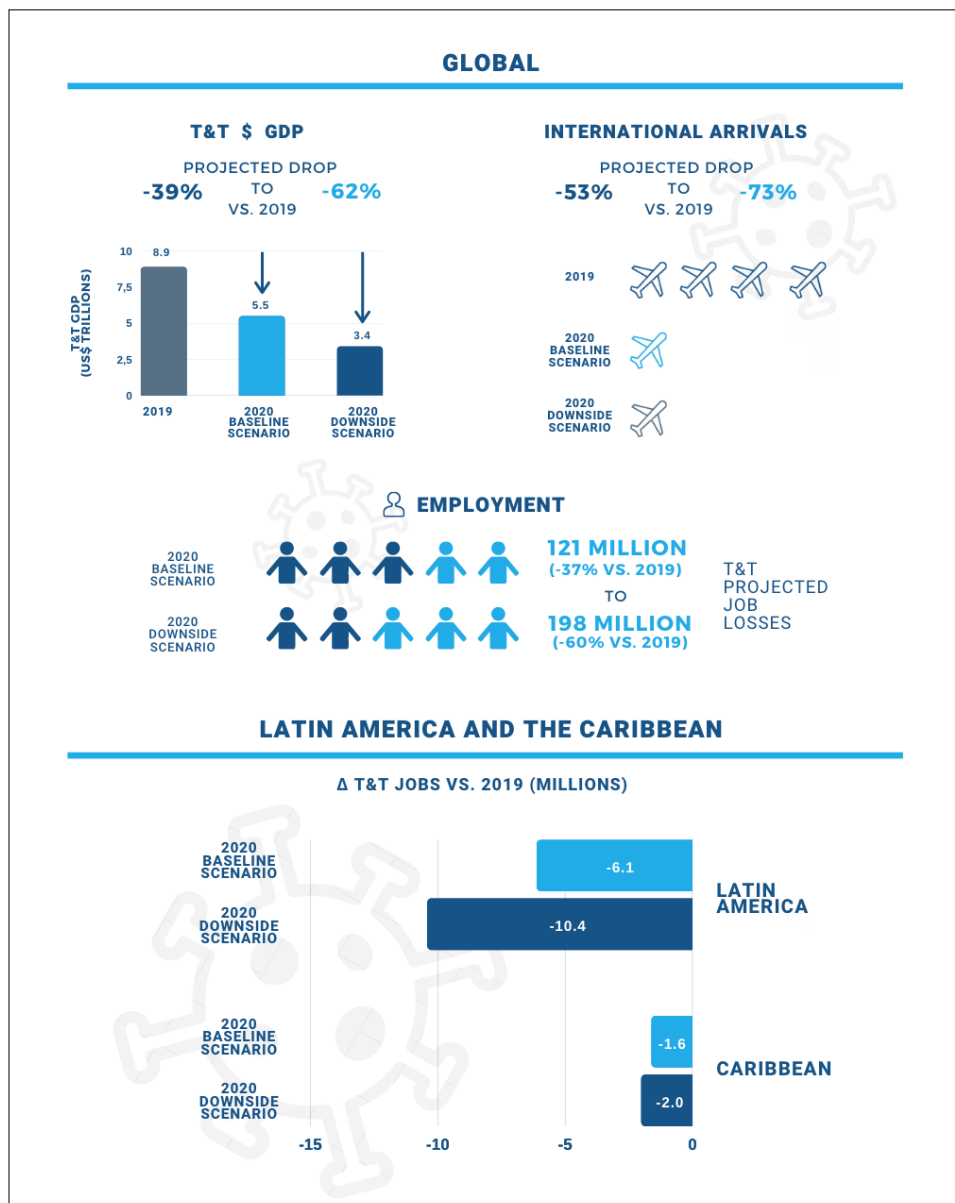
⁹ See the Glossary for definitions of direct, indirect, and induced income.

has significant potential as an engine of growth for the world economy, which is especially important as economies try to recover from the impact of the global pandemic.

Until March 2020, the tourism industry had been growing fast. This growth has been coupled with increasingly critical social and environmental challenges, such as rising GHG emissions, excessive water consumption, large volumes of waste and untreated wastewater, damage to biodiversity and local cultures.

The effects of the COVID-19 pandemic further amplify these existing challenges, threatening growth prospects and millions of jobs. As shown in Figure 6, global tourism job loss estimates for 2020 range from 121 and 198 million, with a potential loss of up to US\$5.5 trillion in GDP (WTTC, 2020c).

Figure 6 | Global Travel & Tourism Industry: Economic Impact of COVID-19



Source: WTTC (2020c).

There are many actors involved in the tourism industry, including hotels, transportation companies, travel agencies, accommodation and/or food service providers, and excursion agents, among many others. Three sub-sectors will be analyzed in this report: hotel chains, cruise lines, and convention centers.

Figure 7 | Hotels, Cruises, and Convention Centers: Main Industry Indicators

Hotels	Cruises	Convention Centers
US\$570 billion annual income	US\$68 billion annual income	US\$12 billion annual income
10 hotel companies account for 60% of rooms globally (2019)	4 cruise corporations hold 85% of the market	No market concentration by big operators
17 million rooms in 185k hotels	Average of 78,000 tourists transported/day	13,000 meetings globally/year
Average of 92 rooms/hotel	Up to 9,000 people/ship (including crew members)	Variable number of visitors/event Biggest event → CES in Las Vegas: 150,000 people
<i># kg of FW/occupied bed (no data)</i>	<i># kg of FW/passenger (no data)</i>	<i># kg of FW/visitor (no data)</i>

Sources: Cruise Industry News (2015); Cruise Industry News Annual Report; CLIA (2019); ICCA (2018); Hotels Magazine (2020); and Statista (2019).

2.1. Hotels

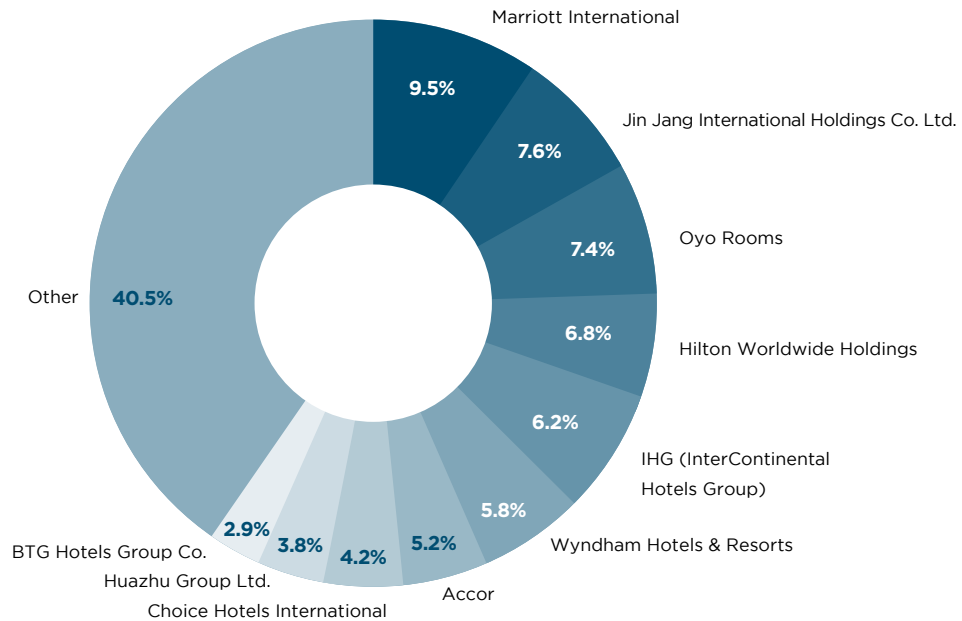
The hotel industry encompasses all forms of business related to the provision of accommodation, food and beverages, and other services intended for guests. It directly generates US\$570 billion a year (Statista, 2019). The industry is constantly evolving in response to new trends and market disruptions. For instance, the appearance of a new player a decade ago has convulsed the market, becoming the biggest hotel in the world without investing in a single property: Airbnb. The booking platform has managed to create millions of new “available beds” in underutilized spaces at private homes and allowed small service providers (owners of those spaces) to access a new source of income. Airbnb recently surpassed 6 million published listings (Airbnb, 2019). Most recently, the industry has had to quickly adapt to a disruption of a different sort- the global COVID-19 pandemic- by launching new food service, cleaning, and physical distancing protocols.

Supply is highly concentrated, with only 10 hotel companies accounting for about 60% of rooms in the world, as shown in Figure 8. The industry is very competitive, and players are constantly evaluating competitors’ improvements. Regarding FW management, this concentration of supply can facilitate the dissemination of good practices, toolkits, and data-driven analysis. Moreover, it can foster a new status quo where all big chains set increasingly ambitious FW reduction targets.

The hotel market is highly concentrated in big chains, which own thousands of hotels in various categories. While this can facilitate the scalability of FW management programs, the different sizes and capacities of hotels within major chains remains a constraint.

Another relevant characteristic is that the top hotel chains are composed of thousands of hotels; Marriott has over 7,000. This large number of hotels of various categories within a chain can facilitate the scalability of FW management programs. However, their heterogeneity requires context-specific solutions which may hinder the expansion of standard approaches. Most hotel chain representatives interviewed for this report stated that the big chains encourage their hotels to work on FW reduction but in a voluntary and non-standardized way, letting each hotel implement its own solutions.

Figure 8 | Hotel Industry Market Share 2019 (% rooms)



Source: Hotels Magazine (2020)

Historically, Food & Beverage (F&B) departments were not an important source of revenue for hotels and were considered a “necessary evil”. Today, F&B is still not a core and/or attractive business for many hotels and hotel chains, which commonly outsource these services. Therefore, promoting FW management as a cost reduction strategy may not be attractive enough for hotels.

However, FW management might take on greater economic importance for businesses such as all-inclusive hotels where F&B is a core part of their services. Due to their business model, all-inclusive hotels offer guests all-you-can-eat buffets, a wide variety of food, and even free room service, consequently generating high guest expectations in this regard.

Something similar happens with hotel breakfast buffets. Since customer perceptions of hotels' food service quality are often based on the quantity and variety of food offered, hotels may be reluctant to change this practice.

FW management efforts need to address these ingrained customer habits and expectations and long-standing industry practices. The coronavirus pandemic has accelerated the need to change food service protocols in light of health and safety concerns, offering an opportunity for the sector to rethink the extensive use of buffets.

A characteristic of the hotel sector that can encourage the implementation of FW management measures is the fact that many hotels already have sustainability certifications or environmental management systems in place. Initially, FW management was not required by sustainability certifications. However, in 2016 the international accreditation body for sustainable tourism certification, the Global Sustainable Tourism Council (GSTC), made FW management mandatory. This has helped to mainstream the topic across the industry.¹⁰ In addition, the sustainability areas of hotel chains have incorporated FW as a key aspect of their strategies, and most have set FW reduction targets. As a result, FW is occupying an increasingly important place on hotels' sustainability agendas, and it is becoming common practice to certify environmentally friendly practices including FW.

Figure 9 | Characteristics of the Hotel Industry and Opportunities for Food Waste Management

Characteristics of the Hotel Industry	Opportunities for Food Waste Management
<ul style="list-style-type: none"> • Existing frameworks for environmental issues (sustainability departments, certifications, management systems). • Increasing demand for sustainable operations from investors and clients. • Common service formats that increase FW (buffet, all-inclusive). • Market dominated by big chains and corporations. • F&B service is not core to the business and is often outsourced. 	<ul style="list-style-type: none"> • Leverage existing frameworks to promote investment in FW reduction. • Increasing resources for addressing environmental issues including FW. • Re-think food service assumptions. • Exchange of information and good practices among chains. Replicate measures in different countries to quickly scale within a corporation. • Cost savings can be a powerful incentive for hotels (all-inclusives) where F&B is a core business.

¹⁰ According to Claudia Núñez from Hoteles más Verdes.

2.2. Cruises

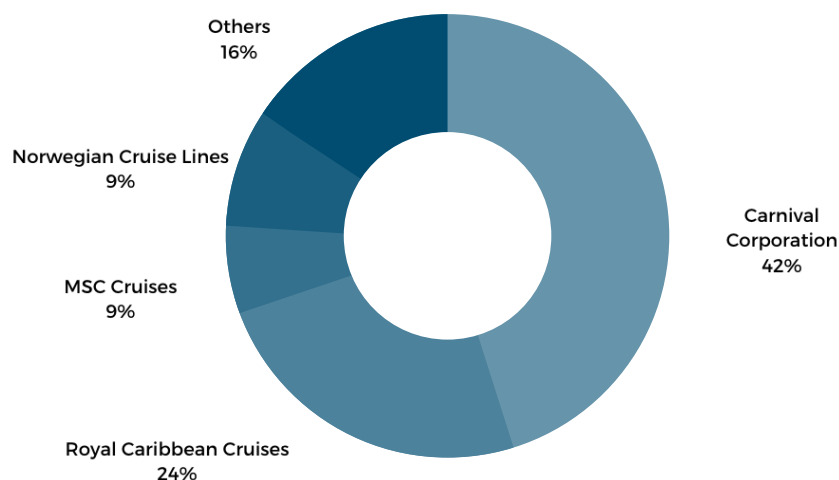
While international land-based tourism has seen a five-fold increase since the 1970s, cruise tourism has increased forty-fold during the same period (Fernández Miranda, 2012). According to the Cruise Lines International Association (CLIA) (2019), the cruise industry generated direct income of US\$68 billion in 2018 and a total income of US\$150 billion. It represents about 2% of the total number of people mobilized by the travel and tourism industry. This translates into 28.5 million passengers embarked in 2018, representing a 75% increase since 2008. Despite these past growth trends, the coronavirus pandemic has hit the cruise industry hard, keeping ships docked for months.

F&B is a core part of cruise services, and the whole food experience (dining rooms, buffets, room service, food quality and variety) has a huge impact on guest satisfaction. Customer perceptions of food quality and service standards are strongly associated with pleasure and, in turn, directly affect future behavior as measured by return visit intention and likelihood to recommend the experience.

Tourist expectations of abundance when taking a cruise vacation or staying at an all-inclusive hotel contribute to the high generation of FW.

Cruises generally offer food service in an all-inclusive style. Since it is a tourist niche characterized by high quality and luxury options, it must have a variety of food alternatives. This generates large amounts of waste per passenger. The fact that almost 85% of the market is concentrated in only four companies represents a prime opportunity to set FW management targets as a new status quo. If one of these large players decides to concentrate its efforts and redirect its goals, it can have a great impact. For instance, as cruise companies plan their reopening strategies in a post-COVID world, one of the main contributors to FW on cruise ships - self-service buffets - will have to be adjusted.

Figure 10 | Largest Cruise Companies



Source: Cruise Industry News (2020).

The planning, purchase, and supply processes for cruises are crucial because once they have started their journey, these gigantic ships do not re-stock merchandise until they return to their port of origin. The extra food supplies purchased in case of emergencies also contributes to the high amounts of FW generated.

Cruise ship kitchens are another source of the problem. The industry imposes tight timeframes to prepare thousands of dishes, creating huge amounts of FW in kitchens. There is also high turnover among kitchen staff (who are generally poorly qualified), which implies high training costs for the company and makes it difficult to instill lasting FW reduction practices.

Cruises present a clear disadvantage with respect to hotels in forming alliances and strengthening food donation policies. Since ships are constantly moving from one country to another, connecting with charitable institutions such as food banks is complex, and making donations entails logistical difficulties.

Figure 11 | Characteristics of the Cruise Industry and Opportunities for Food Waste Management

Characteristics of the Cruise Industry	Opportunities for Food Waste Management
<ul style="list-style-type: none"> • Difficulties managing food purchases. • Sector historically linked to waste. Tourists expect food abundance and demand high quality services. • Mature clients. Loyal customers usually choose cruise vacations again. • High staff turnover and low motivation of kitchen workers. • Cruises are constantly moving from one country or city to another, subject to different food donation regulations. 	<ul style="list-style-type: none"> • Improve understanding of demand to make well-planned purchases. • FW measures should avoid generating a perception that food quality and service has decreased. • Clients and employees should be informed about the results of FW management measures to encourage engagement. • Develop simple and replicable food donation procedures in case of interaction with authorities at different ports. • Cruise lines could lobby to achieve homogeneous regulations regarding FW management.

2.3. Convention Centers

Convention centers are built for the purpose of hosting events, conferences, or meetings of any type. They are an alternative way of generating tourism that has wide economic impacts. In fact, some cities have positioned themselves as hubs for meetings and conventions.

International conferences represent an important segment within the meetings industry, with good growth projections before the COVID-19 crisis. According to the International Congress and Convention Association (ICCA) (2019) in 2018, more than 12,937 meetings were organized globally¹¹, 3% higher than in 2017 and representing more than US\$12 billion.

¹¹ The statistical report of the ICCA only covers meetings organized by international associations that host at least 50 participants, happen regularly, and rotate in a minimum of 3 countries.

Of course, the in-person international conference circuit has ground to a halt due to the COVID-19 pandemic. Though lodging operators expect the groups and meeting business to recover, the consensus is that it will be one of the last demand segments to return. In addition, given the advent of certain technologies that have allowed for meetings to take place virtually, there is uncertainty about when this segment will experience pre-crisis demand levels.

Nevertheless, there are several benefits of convention centers, such as the fact that they mitigate the typical seasonality of the tourism sector, attracting visitors to cities that they may not have visited otherwise, and their demand for skilled workers. People who travel for a conference may extend their stay a few days, further increasing activity in the destination city.

Hotels are great allies of convention centers, not only because they offer lodging for conference attendees but also because they usually host the event itself by offering a complete package whereby organizers can delegate most of the event’s organization to the hotel.

Regarding food service, convention centers typically lack kitchen staff and instead hire catering companies. Therefore, for the purposes of this study, catering companies will be considered a fundamental actor in the generation and prevention of FW in these establishments. While convention centers are not directly involved in food preparation and, consequently, FW generation during events, they have a role to play in raising standards among the caterers they hire and can facilitate the implementation of measures to reduce the FW generated at their facilities. For instance, in order to prevent FW, a good forecasting of demand is crucial. While the event organizer is in charge of estimating the number of attendees, the convention center or catering service can help with tools to better estimate attendance, such as digital surveys or attendance confirmation software.

Figure 12 | Characteristics of the Convention Center Industry and Opportunities for Food Waste Management

Characteristics of the Convention Center Industry	Opportunities for Food Waste Management
<ul style="list-style-type: none"> • High initial investment costs and long-term return horizons. • Dynamic industry where event exhibits are assembled and disassembled rapidly. Daily operations cannot fail or be limited for any reason. • Sustainability is usually not a factor when organizers select a convention center, except for very specific events. • Food services are usually outsourced to catering companies. Lack of clarity about who “owns” the food (the convention center, the catering company or the event organizer). 	<ul style="list-style-type: none"> • Possibility to include specific budget lines for FW management measures in the early planning phase. • FW measures could be integrated into existing procedures to not hinder their dynamism. • Convention centers could start advertising FW management practices to differentiate themselves and add brand value. • Convention centers could propose FW management measures to catering companies. Crucial to clarify the implications of FW measures in contracts between the convention center and/or the organizer and/or the caterer.

CHAPTER 3

FOOD WASTE AND TOURISM

This section presents the available information regarding FW in the tourism sector as well as remaining knowledge gaps. The main drivers and challenges of FW in the tourism industry are described, as are the key factors that influence FW generation and management among hotels, cruises, and convention centers.

3.1. Measurement Challenges

First, it is important to highlight that there is a clear lack of information regarding FW in the tourism industry. Indicators that are available describe the FW problem at the macro level (see Chapter 1), only providing estimates based on stage of the food value chain and world region. When looking into specific industries within the value chain or specific countries, data is scarce. Figure 13 summarizes the data availability for each type of FW indicator.

Figure 13 | Status of Data Regarding Food Waste

Type of Indicator	Status
<p>Quantity of FW by type of business. Examples:</p> <ul style="list-style-type: none"> • Hotel → kg of FW/(day x guest) • Cruise → kg of FW/(day x passenger) • Convention center → kg of FW/(day x visitor) 	<p>Regarding FW generation, there are very general estimates that do not describe the tourism sector in particular. For example, estimates of total kg of FW per person, per year, per region, by step of the food value chain, including consumption, but not disaggregated by tourism-related activities (see Figure 1).</p> <p>There are no reference values by type of business or by category within an industry. For example, it is not clear what is a standard quantity of FW per tourist for an all-inclusive hotel, a five-star hotel, or a cruise.</p> <p>UN Environment is preparing the Food Waste Index (still in development as of mid-2020), focusing on the retail and consumption stage, including waste produced by restaurants and hotels. It will measure tons of wasted food per capita, considering a mixed stream of products from processing through to consumption (FAO, 2019a).</p>

<p>Composition of FW by type of business</p>	<p>No substantive research has been done on patterns of waste composition per type of business. It is also unclear whether patterns can be extrapolated from other stages in the food value chain.</p> <p>Various hotels are now using smart scales that allow for an assessment of waste quantity and composition. Hotels and companies providing this service (e.g., Winnow and Leanpath) are generating valuable data but no results have been published to date.</p> <p>Several FW composition studies from hotels in Finland (Nguyen, 2018) and the UK (WRAP, 2013) were found. Results shed light on the main categories of products that are wasted but cannot be extrapolated because they may vary significantly between countries and categories of hotels.</p>
<p>Environmental footprint</p> <ul style="list-style-type: none"> • Converter of tons of FW into Carbon Dioxide Equivalent (CO₂e) applicable to the tourism industry • Per capita food wastage footprint (CO₂e/tourist) 	<p>A widely used converter estimates that 1 ton of FW produces 2.5 tons of CO₂e (FAO, 2013). However, this is an average that does not properly take into account the lifecycle of the products wasted by the tourism industry.</p> <p>FAO (2013) estimates the annual per capita food wastage footprint by region (For example, 540 kg CO₂e/person for Latin America and 860 kg CO₂e/person for North America and Oceania). However, there are no estimates for the tourism sector.</p>
<p>Economic impact</p> <ul style="list-style-type: none"> • Economic value of wasted food (US\$/kg) 	<p>There are estimates from BCG (2018) regarding the economic value of world FW at the consumption level (US\$1.47/kg). This average value probably underestimates the value of food wasted in the tourism sector, which has a higher economic value than food wasted by households.</p> <p>The WRAP study (2013) calculated the value of a ton of FW in the UK Hospitality and Food Service sector, disaggregating it by subsector and composition. For instance, the cost for hotels was £4/kg, while it was £3.5/kg for restaurants, and £2.2/kg for staff catering.</p>

Furthermore, the few existing estimates are generally not comparable. For example, some hotels have estimated their FW as “number of meals wasted”; however, they do not define the grams of food associated with each meal, to be able to compare them to other estimates calculated in weight units. The varying sizes of establishments in the subsectors also complicates quantity estimates. On one end of the spectrum there are huge all-inclusive resorts and cruise ships, and on the other, boutique hotels, family-run guesthouses, and Airbnb apartments. Moreover, there are no clear FW reduction targets since there is still no consensus on how much FW could be considered reasonable.

Hotels are increasingly announcing ambitious reduction targets considering total waste (e.g., reduce total FW by 50% by 2020). However, defining achievable and measurable

per capita FW reduction targets is also crucial and might help assess operational performance, prioritize FW reduction measures, and assign associated budget.

In addition to generating data on FW quantity and composition, the sector would also benefit from assessing the potential economic savings of decreasing FW, the cost of typical reduction measures, and adequate timeframes for setting reduction targets.

In general, the methodologies used to quantify FW are not clear. The available reports only provide the final results without specifying the measurement methods, the scope of the analysis, the timeframe and assumptions, among other key factors. There is also a lack of information on the error or level of confidence of the results. Typically, results should be presented as (X kg +/- Y kg) where X is the result and Y the error associated with the result for a level of confidence of W%. It is not the same to say that 500 kg of food is wasted than to state that 500 kg +/- 50 kg of food is wasted every month with a 90% level of confidence.

Challenges: Food Waste Measurement in the Tourism Sector

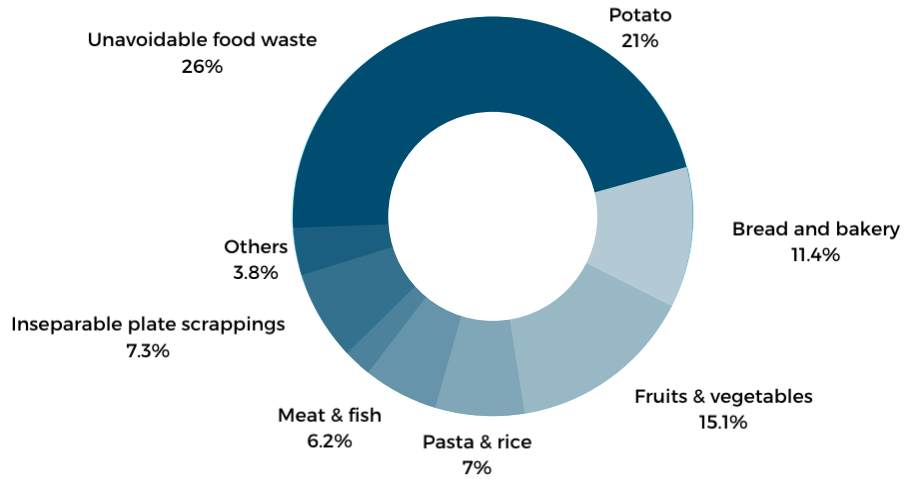
1. Lack of data about generation and composition.
2. Unclear methodologies used by existing measurement efforts.
3. Lack of information on the level of error or confidence of the results.
4. Lack of evidence-based estimates on the potential savings, the cost of measures, and the return period of the investments.
5. Difficult to set targets due to lack of information on average waste generated by different types of businesses.

Despite the lack of information on the quantification of FW in the tourism industry, some studies arrive at interesting conclusions regarding the composition of waste in this sector.

FW is classified into two categories: edible parts and associated inedible parts. For example, bones are associated inedible parts of some cuts of meat and constitute unavoidable food residues. It is estimated that unavoidable FW accounts for approximately 26% of all FW arising from the hospitality industry, food services, and retail food stores in the UK. This means that the remaining 75% of FW is avoidable (WRAP, 2013).

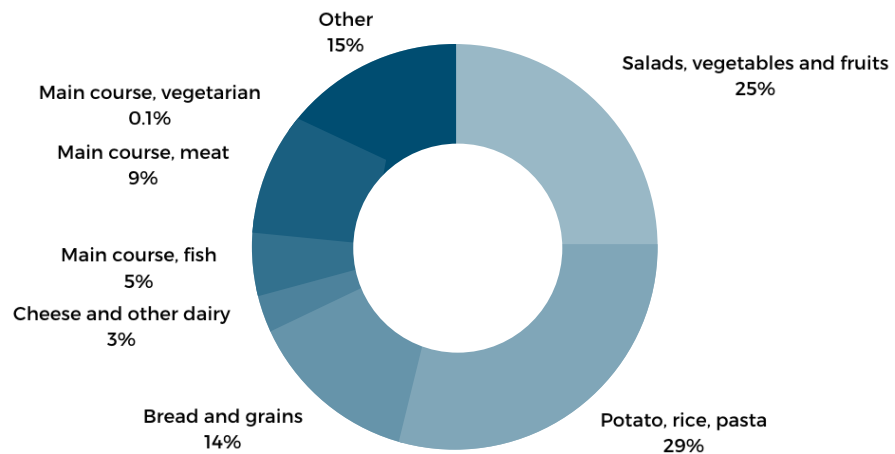
This study also found that 35% of the food wasted in the UK is carbohydrates, including potatoes, bread, pasta, and rice (Figure 14). A study conducted in hotels in Finland found similar values, although it used different categories (Figure 15).

Figure 14 | Food Waste in UK Hospitality and Food Service Sector by Type



Source: WRAP (2013).

Figure 15 | Food Waste in Hotels in Finland by Type



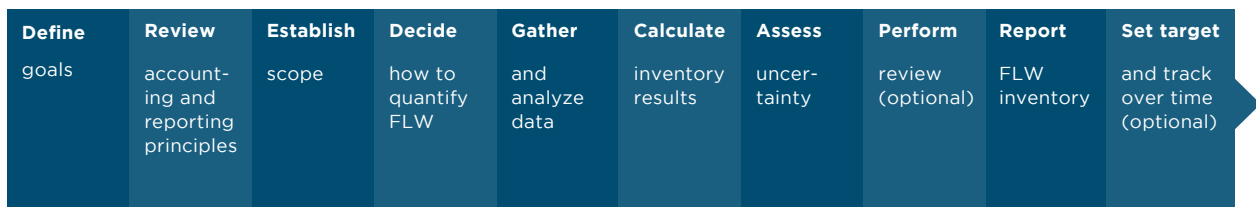
Source: Nguyen, L. (2018).

3.2. Food Loss and Waste Protocol

Despite the lack of information described above, the good news is that there is a methodology which could help to plan future estimation efforts and harmonize results. The World Resources Institute (WRI) and a consortium of expert institutions have formed the Food Loss & Waste Protocol to develop a globally recognized voluntary standard that supports and encourages increased measurement of FW. In 2016, the Protocol launched the Food Loss and Waste Accounting and Reporting Standard¹². It enables entities to quantify and report in a credible, practical, and internationally consistent manner how much and where FW occurs, and therefore understand its causes.

The Standard aims to create an inventory of food wasted and develop comparable data based on a harmonized methodology. It also provides guidelines and a tool¹³ to help users select among alternative measurement methods. It clarifies definitions and has the necessary flexibility to be adapted to different sectors and business sizes. The proposed steps to create an inventory are summarized in Figure 16.

Figure 16 | Overview of Steps in Food Loss and Waste Accounting and Reporting



Source: Food Loss & Waste Protocol (2016).

How does the Standard work? First, it is important that businesses (hotel, restaurant, cruise, etc.) understand the reasons why they should invest time, energy, and resources to develop an FW inventory, and **set goals** accordingly. The goals will mainly influence the method chosen to quantify losses and the definition of the scope. Afterwards, the Standard suggests a revision of the Accounting and Reporting Principles established in the guidelines.

¹² Food Loss and Waste Accounting and Reporting Standard.

¹³ [Guidance on Food Loss and Waste Quantification Methods and Food Loss and Waste Quantification Method Ranking Tool](#).

ACCOUNTING AND REPORTING PRINCIPLES

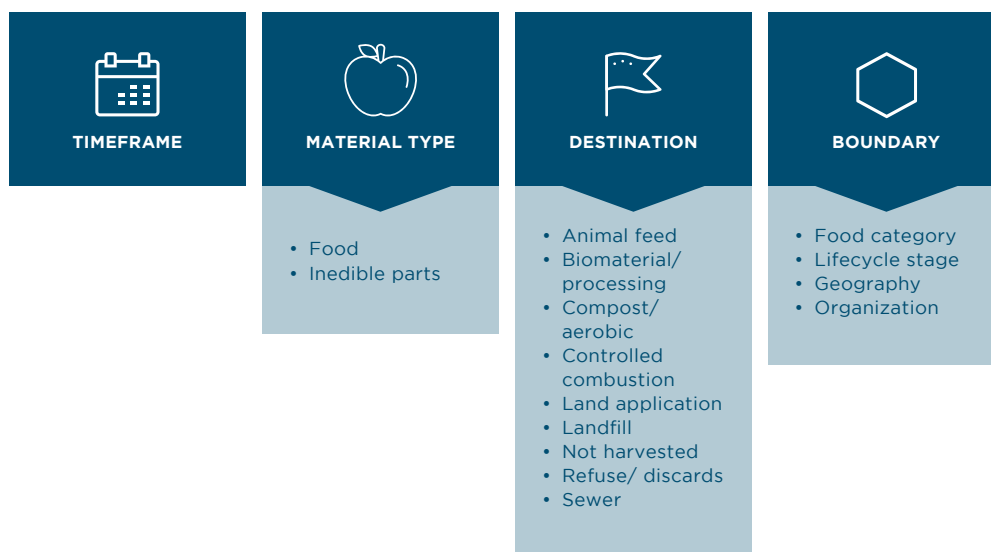
1. **Relevance:** Ensure that the quantification method(s) for developing the FW inventory and report serve the decision-making needs of the intended user. Present information in the inventory report in a way that is readily understandable by the intended user.
2. **Completeness:** Ensure that the FW inventory report covers all FW within the scope selected for the inventory. Disclose and justify any exclusions, for example, FW that could not be quantified because data was too difficult to collect.
3. **Consistency:** Use consistent methods to allow for meaningful tracking of FW over time. Provide transparent documentation of any changes to the data, inventory scope, approaches to quantification, or any other relevant factors in the time series.
4. **Transparency:** Address all relevant issues in a factual and coherent manner, based on clear documentation. Disclose any relevant assumptions and make appropriate references to the quantification methods and data sources used in the inventory report. Clearly explain any estimates and bias so that the FW inventory report represents what it purports to represent as clearly as possible.
5. **Accuracy:** Ensure that the quantification of FW is systematically neither more nor less than actual FW, as far as can be judged, and that uncertainties are reduced as far as practical. Achieve sufficient accuracy to enable the intended user to make decisions with reasonable confidence as to the integrity of the reported information.

Source: Food Loss & Waste Protocol (2016).

The next step is to **define the scope of the inventory**. To do so, the FW Standard requires the entity to define four aspects (Figure 17):

1. **Timeframe:** the period of time for which the inventory results are being reported.
2. **Material type:** the materials that are included in the inventory (food only, inedible parts only, or both).
3. **Destination:** where FW goes when removed from the food supply chain.
4. **Boundary:** the food category, lifecycle stage, geography, and organization.

Figure 17 | Scope Dimensions for Food Loss and Waste Accounting and Reporting



Source: Food Loss & Waste Protocol (2016).

It is important to mention that an FW inventory is designed to focus only on material that is no longer in the food supply chain. Therefore, the weight of “rescued” food such as donations to food banks or other recipients should not be included in an entity’s FW inventory. Instead, users of the FW Standard are required to record data about rescued food separately.

Once the scope is defined, the entity decides whether to undertake a new calculation and/or use existing data, and **chooses the quantification method(s)**. The Standard does not establish a method for quantification because it must be selected case-by-case based on the goals of the inventory and the available resources. The Protocol provides a “Guidance on Food Loss and Waste Quantification Methods” that includes 10 different options:

1. **Direct weighing**, using a measuring device to determine the weight of FW.
2. **Counting**, assessing the number of items that make up FW and using the result to determine the weight; includes using scanner data and “visual scales”.¹⁴
3. **Assessing volume** (physical space occupied by FW) and using the result to determine the weight.
4. **Waste composition analysis** (physically separating FW from other material) in order to determine its weight and composition.
5. **Records**, using individual pieces of data that have been written down or saved, and that are often routinely collected for reasons other than quantifying FW (e.g., waste transfer receipts or warehouse record books).
6. **Diaries**, maintaining a daily log of FW and other information.
7. **Surveys**, gathering data on FW quantities or other information (e.g., attitudes, beliefs, self-reported behaviors) from a large number of individuals or entities through a set of structured questions.
8. **Mass balance**, measuring inputs (e.g., ingredients at a factory site, grain going into a silo) and outputs (e.g., products made, grain shipped to market) alongside changes in levels of stock and changes to the weight of food during processing.
9. **Modeling**, using a mathematical approach based on the interaction of multiple factors that influence the generation of FW.
10. **Proxy data**, using FW data that are outside the scope of an entity’s FW inventory (e.g., older data, FW data from another country or company) to infer quantities of FW within the scope of the entity’s inventory.

The next step is to **gather and analyze the data** and proceed with the calculation of results. The Standard provides guidance on how to perform the necessary calculations.

The following step is to provide a qualitative description and/or quantitative assessment of the **uncertainty around FW inventory results**, which is very relevant to their proper analysis and comparison. The next step is optional and refers to **assurance of the FW inventory** which may include peer review, verification, validation, quality assurance, quality control, and third-party audits.

¹⁴ Visual scales are practical pictorial aids used in agricultural contexts, typically to help assess the different levels of damage by pests to stored crops.

Finally, **the results are reported in terms of FW weight**, as required by the Standard. In addition to weight, an entity may wish to express FW in terms of other units of measurement to convey environmental impacts, nutritional content, financial implications, or other concerns.

An entity may also choose to normalize FW data to gain additional insights. Normalization involves dividing the weight of FW by a certain factor, referred to as a “normalization factor”, thereby resulting in FW per unit of something else, such as number of individuals (e.g., national population), financial figures (e.g., company turnover), or other relevant factors (e.g., amount of food sold). Normalizing the data generates a metric such as FW per capita, FW per turnover, or FW per amount of food sold. An entity may use normalization to make FW data more meaningful to stakeholders, compare data between FW inventories, and/or better understand changes over time when multiple variables are in flux.

The global Food Loss and Waste Standard was designed to be used by diverse entities with varying goals and capacities. It therefore provides a common foundation upon which others can develop more customized guidance. For example, as part of the Roadmap developed by WRAP, a series of sector-specific frequently asked questions (FAQs) was created. Sector-specific guidance is also available through the Protocol website on the FAQ page.¹⁵

Considerations for Applying the Standard in the Hospitality Sector

1. Measurement is crucial to evaluate the impact of efforts to reduce FW. It should be part of any FW management strategy.
2. Methods must be quick and easy to use given dynamic environments where FW occurs. Measurement must not hinder the business's operating processes.
3. Calculating kg of waste per day calls for a precise method because even a one kg difference counts.
4. Placing a small scale in the kitchen is a practical solution.
5. Information about composition is essential to determine the causes of waste and prioritize reduction measures. For example, some products used in hotel kitchens (meat, seafood, cheese) are more expensive than others (bread, fruits). So even if the first group represents a smaller percentage of the problem in terms of weight (kg), it might be worth reducing its waste first in order to achieve greater cost savings.
6. It may be useful to consider “inedible parts” separately because a substantive amount might be the result of the elaborate menus offered by some hotels.
7. It is important to know how much food is available for donation.
8. The best waste quantification methods are among those proposed by the Standard: direct weighing, diaries, waste composition analysis, and surveys.

The Food Loss & Waste Protocol is a useful tool to guide the implementation of an FW inventory. The Protocol is adaptable to the needs and resources of each entity, so it

¹⁵ Specifically under the topic of: “Where can I find sector-specific guidance about using the Food Loss and Waste Standard? Accessible at: <https://flwprotocol.org/flw-standard/faqs/>

works best when the entity has clearly defined the scope of its inventory. A useful tip for helping new users with the Protocol is to refer them directly to the summary and only refer them to the main document when they need further information. Otherwise, the long version may be overwhelming and might discourage establishments from implementing the inventory.

Even though the methodology is easy to follow, there are some steps that might be challenging. For example, understanding the definition of “food” and “inedible parts” since it may be confusing for some users to determine if something should be considered inedible or not. Also, the selection of the measurement methodology is a key decision as it can affect the complexity of developing the inventory. The good news is that for most establishments in the hospitality sector, weighing FW with a kitchen scale is a feasible, easy, and accurate enough methodology to use. A third challenge is that the Protocol requires users to report where the food and/or associated inedible parts go once they are removed from the food supply chain (i.e., animal feed, compost, landfill, etc. as shown in Figure 17 above). It might be challenging for an establishment to report the destination of FW because they simply may not know what happens to it after garbage collection.

Various online tools are available to help users implement the Protocol. WRAP developed the guideline “Food surplus and waste measurement and reporting guidelines for the Hospitality and Food Service Sector”¹⁶. Other tools help record data and calculate FW, such as “Your business is food; don’t throw it away” tracking sheets and calculator¹⁷ or Unilever Food Solution’s “Wise Up on Waste” calculator¹⁸.

¹⁶ Accessible at: <https://www.wrap.org.uk/sites/files/wrap/hospitality-and-food-service-sector-guidance.pdf>

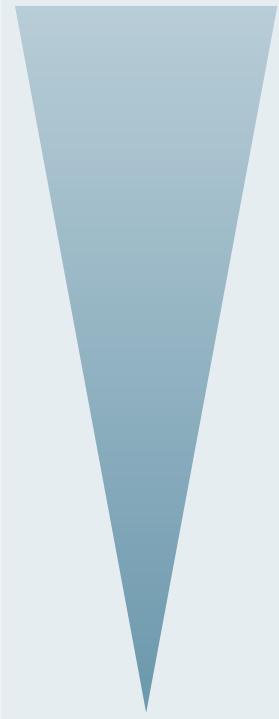
¹⁷ Accessible at: <https://www.wrap.org.uk/content/your-business-food-don%E2%80%99t-throw-it-away-0>

¹⁸ Accessible at: <https://www.unileverfoodsolutions.com.au/chef-inspiration/chef-training-and-resources/managing-food-waste/wise-up-on-waste-toolkit.html>

3.3. Drivers of Food Waste in the Hospitality Sector

Various decisions and procedures can drive FW generation, from developing the menu and estimating demand to choosing food service models. It takes place at different stages within a business for a variety of reasons, as summarized in Figure 18. FW generation can also be driven by client decisions, preferences, and behaviors as well as by external factors such as the regulatory context.

Figure 18 | Food Waste Drivers in the Hospitality Sector



Opportunity To Reduce Waste And Its Environmental Impact	Stage of the Business	Food waste drivers
	Organizational strategy/priorities	Lack of leadership and commitment from senior management
		Lack of staff awareness about the problem. Lack of FW measurement
	Planning and supply	Strict bromatological standards and procedures that make food donation difficult
		Inefficient demand estimation
		Inefficient stock management
		Overproduction
	Food production	High aesthetic standards for fruit and vegetables
		Inefficient handling
	Food service	Deficient communication between kitchen and service staff
		Large portions
		Inefficient service level ¹⁹
		Buffet mode
	Consumption	Lack of information on the prepared dishes
		Lack of awareness
Post-consumer	Use of big plates and inadequate containers, use of trays.	
	Lack of food donation programs Lack of Good Samaritan laws	

Source: Authors.

Some drivers cut across all stages. For instance, lack of leadership and commitment from senior management translates into a lack of communication about the importance of addressing the FW problem.

The Hotel Kitchen project (2017), an initiative led by the American Hotel & Lodging Association (AH&LA) that involved testing different FW reduction strategies, interviewed 200 people on the staff teams of 10 hotels. Most of them highlighted that they wanted to do much more than they were currently doing to reduce FW but were lacking clearly defined roles, incentives, and reduction targets. They attributed the failure to a lack of clear directives from senior management.

¹⁹ Inefficient level of service implies, for instance, that the establishment keeps the same amount of food in the buffet throughout the day, when demand actually fluctuates.

Another important driver, which can be the result of lack of leadership, is the inadequacy of staff awareness, commitment, and training on the problem. In many of the interviews conducted as part of the Hotel Kitchen project, respondents highlighted what works well to raise awareness. For instance, the more head chefs are involved in the process of enforcing FW reduction measures, the better. Respondents also pointed out that some people are not aware of the quantity that is wasted, so simply measuring FW and sharing the data can be a very good starting point to work on the topic.

“Chef involvement is crucial to the success of the project. In general, they are very happy not to have to throw food in the trash. Some of them have even proposed doing extra activities such as cooking classes with the community kitchens.” Almendra Ortiz, leader of the “Al Rescate” team, Food Bank Network of Mexico (BAMX).

It is also worth mentioning a study from the “Fight against food waste in hotels” manual prepared by the Hotel Kitchen project (2017), carried out by Dr. Steve Schein and Bellinson & Co (2016), which surveyed 32 participants from multiple hotels, including chefs, F&B directors, and general managers. It concluded that:

- Few establishments have a plan regarding FW or a dedicated person responsible for coordinating efforts.
- Participants expressed a strong need for specific training and education that is lacking throughout the industry and its operations.
- FW measurement and monitoring is limited and informal.

A top manager of a catering company interviewed for this study highlighted the influence that “kitchen workers” have on FW generation. A “kitchen worker” is somebody who: (i) works mainly for cruise lines or big hotels; (ii) is not a professional; (iii) works long hours for a low salary; and (iv) works away from his/her home and has few days off. These conditions encourage a lack of commitment and motivation at work, which can lead to procedures being breached, carelessness in the use of raw materials, and prioritizing speed over taking steps to avoid generating waste.

Overproduction is one of the main drivers of FW. It is caused by two main factors. The first is the unpredictability of demand. Chefs often have trouble estimating the number of guests that are going to attend as well as choosing which menu will be the most preferred and profitable. If the kitchen offers a wide variety of dishes that change frequently, this can contribute to waste generation. To improve predictability, it is necessary to study customer preferences and other factors, such as seasonality, weather patterns, and local competition. The second factor is the hospitality industry’s tendency to promote a sense of abundance when it comes to food so that customers feel that they get what they paid for.

The audit of an 800 person event conducted by the World Wildlife Fund (WWF) showed that the kitchen produced approximately 0.9 kg of food per person for lunch when, on average, only about 0.45 kg per sitting person was consumed. This adds up to approximately 363 kg of excess food per meal. (Hotel Kitchen, 2017)

Given the difficulty of predicting demand and the fear of underestimating it, kitchens often add a “safety margin” to their food calculations. This is a common practice at all stag-

es of the value chain. For example, an event organizer hires a caterer and overestimates attendance. If attendance at an event is estimated at 2,500 people, the event planner will interpret it as "2,500 plus 3% diners, mostly men, and big eaters". The chef will prepare a little extra. On the day of the event, the food manager will display all the food prepared by the kitchen to ensure that the buffet looks abundant. In turn, this encourages guests to serve themselves more than they can eat because they may fear that the food will be gone by the time they return for a second serving. These "safety measures" taking place throughout the process result in the production of tons of excess food.

According to Hotel Kitchen (2017), while 85% of hotels admit that they add some safety margin to their food production levels, only 32% encourage a donation program to handle this excess food. However, many have internal reuse policies to manage a part of this overproduction.

Buying food products that end up not being used due to poor menu planning and purchasing has a huge impact on waste generation. Poor menu planning or inflexible menus also make it difficult to reuse ingredients that are about to expire for other dishes on the menu. The prevailing high aesthetic standards for food such as fresh produce also create a huge amount of FW both for suppliers and kitchen staff. It is understandable that hotels or cruises want their food products to remain fresh, beautiful, and abundant when on display. However, this can result in an excessive amount of waste.

"Working at the purchasing and menu planning level has the biggest impact." Caitrin O'Brien - Senior Manager, Corporate Sustainability, Hilton.

While food safety is the first priority in any food-serving establishment, it can lead to indiscriminate food disposal. When food is wasted due to expiration dates, temperature requirements or handling protocols, improvements to these procedures must be devised and implemented.

Apart from the above-mentioned drivers, within a tourism business there are important external factors that influence FW generation. First, the industry has already established standards or "good practices" that foster FW, such as the common use of buffets that must always be abundantly full of food. When it comes to cruises and "all inclusive" hotels, the concept of having access to abundant food choices at all times is part of the experience. Therefore, the reputation and reviews of these establishments are highly dependent on food service.

Second, the lack of regulations around food donations in some countries encourage FW generation. In the case of food surplus, if it is suitable for human consumption, ideally it should be donated or sold at a discount. Tourism sector businesses could donate excess food and reduce FW; however, many are reluctant to develop donation programs due to legal risk. The lack of donation-friendly legal frameworks, such as the well-known "Good Samaritan law," directly contributes to this problem in many places (see Section 5.1 for further information).

PART II

The Opportunity

Why the Tourism Sector is a Strategic Industry to Fight the Food Waste Problem



CHAPTER 4 THE OPPORTUNITY BEHIND THE PROBLEM

4.1. Competitive Advantages of the Tourism Sector to Tackle Food Waste

Given the magnitude of the problem laid out in Part I, it is logical to think that there must be opportunities to alleviate malnutrition, generate revenue, and reduce environmental impacts by addressing FW. The 340 million tons of food wasted annually at the consumption level represents approximately US\$500 billion. Any investor could see a potential source of revenue and/or cost savings given these figures.

Undoubtedly, there are good reasons to invest in FW management activities, and the tourism sector has a number of competitive advantages in this regard (Figure 19), especially given the increased need to improve operating margins as a result of the COVID-19 pandemic.

Figure 19 | Competitive Advantages of the Tourism Sector for Investing in Food Waste Reduction

<p>(i) Existing environmental frameworks can facilitate FW management</p>	<p>Tourism sector companies' existing environmental management systems and green certifications are an ideal framework to begin working on FW management.</p>
<p>(ii) Concentration of FW at the consumption stage where economic impact is greatest</p>	<p>The food wasted in the tourism sector is mainly prepared food lost at the final consumption stage; therefore, both costs and savings opportunities are higher than in other sectors.</p>
<p>(iii) Conducive conditions for behavioral change for both consumers and businesses</p>	<p>Tourists are already familiar with other hotel sustainability efforts (saving water, reusing towels, reducing single-use plastics) and consumers are increasingly aware of the FW problem. This awareness coupled with the importance of customer reviews for influencing tourists' decision-making can incentivize companies to address issues such as FW that could tarnish (or bolster) their image.</p>
<p>(iv) Market and geographic concentration of hotels and cruises</p>	<p>Concentration of hotel and cruise supply and tourist density can facilitate economies of scale in implementing FW measures.</p>

i. Existing environmental frameworks can facilitate FW management

The tourism industry seems to be well-prepared to address FW. This is mainly because it has already been working on environmental management plans through certifications or standards, and FW can be addressed within these existing frameworks. In addition, specialists working on the design and implementation of such plans, either within companies or as external consultants, can support FW reduction programs. Useful toolkits and guidelines to address FW in the tourism sector have also been developed (see section 3.2 and Annex C).

The Global Sustainable Tourism Council (GSTC), which develops global standards and serves as the international accreditation body for sustainable tourism certification, included FW in its updated 2016 criteria. Until then, FW was only a part of the Waste Program guidelines and in many cases, no specific FW activities were included. Today, all hotels or tour operators that wish to become GSTC-certified must take actions to manage FW.

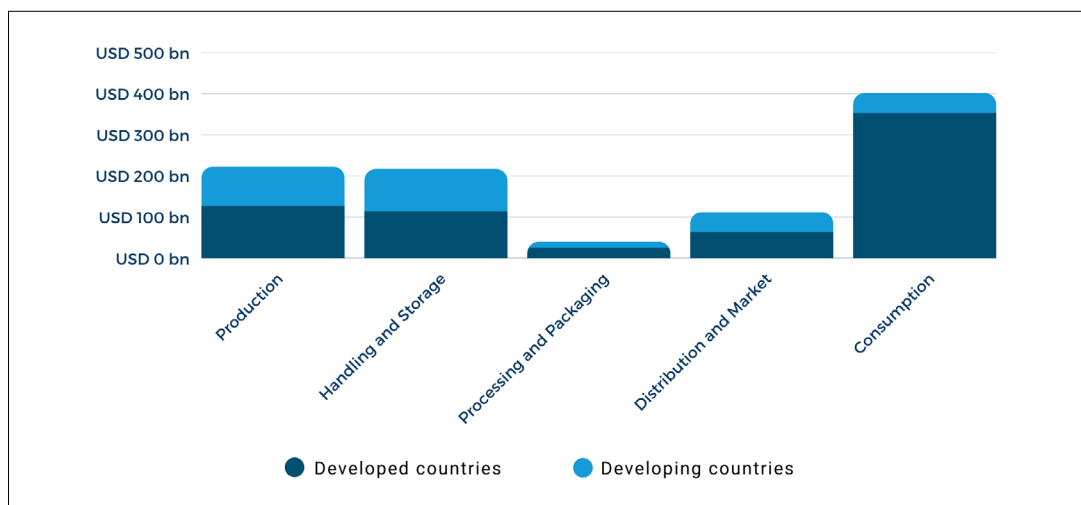
According to representatives from the main hotel chains and cruise lines who were interviewed as part of this study, FW initiatives are well underway. They all agreed that it is one of the main environmental challenges they face, and many have already set specific reduction targets (generally in line with the SDG 12.3 target). For example, Accor Hotels set the goal of reducing FW by 30% by 2020, and Marriot and Hilton aim to halve their FW by 2025 and 2030, respectively.

“For Accor, food waste is the main environmental issue followed by plastic management.” Larissa Lopes - Accor Hotels.

ii. Concentration of FW at the Consumption Stage where Economic Impact is Greatest

In the tourism sector, the costly concentration of losses at the consumption stage signals an opportunity for significant cost savings if tourism companies take action to reduce FW. The next figure shows how much costlier it is to waste food at the consumption stage versus prior links in the value chain, and that the bulk of consumption-stage FW is generated by developed countries.

Figure 20 | Value of Food Waste along the Value Chain per Year (US\$ billion)



Source: Barclays (2019).

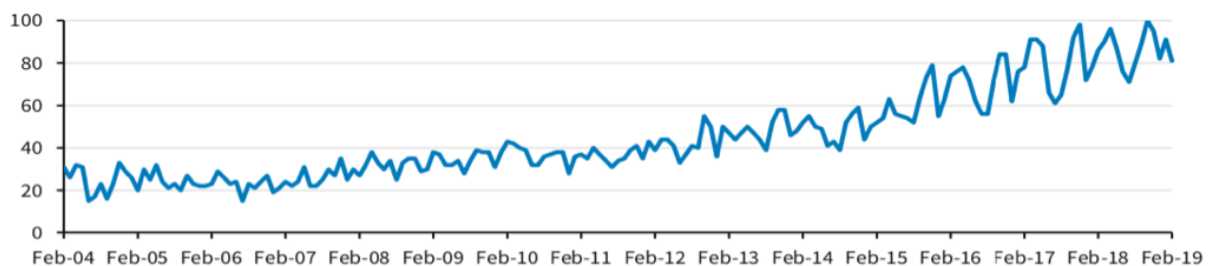
iii. Conducive Conditions for Behavioral Change for both Consumers and Businesses

On the consumer side, many tourists have already embraced hotels' efforts to reuse towels, save water, or reduce single-use plastics during their stays, or at least, they are familiar with these common sustainability efforts. Therefore encouraging guests to "save the planet" in other ways, such as by reducing their FW, may be more feasible than in other sectors.

"We've already seen that hotel guests are more than willing to conserve water and energy, simply by placing a card on their pillows or hanging their towels. Our hunch is that they'll also take action to be part of the fight to cut food waste." Devon Klatell, Associate Director of The Rockefeller Foundation.

Likewise, consumer awareness of the FW problem in general is growing, as illustrated by the increase in Google searches for "Food Waste", particularly in recent years. Much of this awareness is likely due to the issue's greater visibility in the news and on social media.

Figure 21 | Increase in Google Searches for "Food Waste"²⁰



Source: Barclays (2019).

On the business side, this increased consumer awareness coupled with social media visibility and the review-focused culture of the tourism sector can incentivize hotels to address issues such as FW that could tarnish their image (or bolster it if addressed properly).

iv. Market and Geographic Concentration of Hotels and Cruises

Another comparative advantage is concentration. In terms of market share, four cruise corporations represent 85% of the market. The hotel market is highly consolidated into 10 main chains, the largest of which (Marriott) includes 7,000 hotels in its network. This concentration of supply can facilitate the expansion of FW measures and best practices across chains and corporations. Similarly, the geographic concentration of tourism in big cruise lines, resorts, and tourist hubs such as Cancun leads to the generation of high amounts of FW in the same place. Again, this density can help facilitate economies of scale when it comes to addressing the problem and implementing FW measures.

²⁰ Numbers on y-axis represent search interest relative to the highest point on the chart.

4.2. The Business Benefits of Investing in Food Waste Reduction

Companies in the tourism sector can be catalysts for change. This section provides an overview of the business benefits of implementing FW reduction measures, including cost savings, social and economic value creation, reputational returns, and stakeholder engagement.

I. Cost Savings

When food service managers think about the cost of FW, they typically consider only raw material expenses because this is the first direct disbursement made when purchasing food. However, the true cost of FW goes beyond raw materials.

Figure 22 reflects the composition of the total FW costs within a kitchen. According to the research carried out by WRAP, focused on the UK's hospitality and food service industry (2013), the purchase of raw material only represents 52.2% of the total cost, while the remaining 47.8% are "hidden costs".

The total economic impact of FW can be divided into pre-disposal and disposal costs.

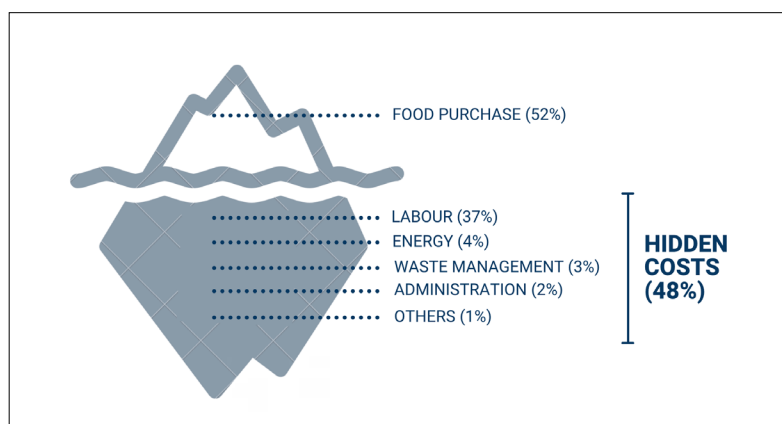
Pre-disposal costs

- Raw material: purchase of products for preparation of food that is never eaten.
- Labor: salaries of kitchen staff in charge of cutting, preparing, and serving food. By wasting production, the fixed value per meal consumed increases, productivity (food produced and consumed per working hour) decreases, and the added value is lost.
- Energy and services: electricity, gas, and water used for food preparation, refrigeration, and storage.

Disposal costs

- Since FW creates unpleasant odors and leachate, it is mandatory to have spacious trash bins, trained personnel, and an adequate collection and disposal system. These aspects represent around 3% of total FW costs (Nguyen, 2018).

Figure 22 | Composition of Food Waste Cost



Source: WRAP (2013).

To optimize potential cost savings, it is important to understand the real cost of FW. Companies and consumers are more likely to implement actions to prevent and reduce FW when they know that positive economic impact will follow. Therefore, quantification instruments and methodologies that reflect the genuine cost of FW are key.

WRAP (2013) also includes useful data for delineating FW costs within the kitchen. It shows that 17.8% of all food purchased by the hospitality and food service industry is wasted, 13.2% of which is avoidable; the remaining 4.6% is unavoidable.

Also, according to Winnow (n.d.), data collected from 450 sites (restaurants, hotels, caterers, etc.) in 25 countries found that between 8% to 20% of total food costs are due to overproduction, kitchen errors, spoiled or damaged produce, and customer leftovers. In some facilities, it can be as high as 40%. Often, this amount can equal or surpass the net profits from a business, which warrants the attention of those watching the bottom line.

Existing Evidence

Considering the total cost of food production (raw material, labor, energy, and services) and disposal, it is clear that actions to prevent FW imply not only cost savings in the purchase of raw materials, but also an optimal use of resources. And since these actions can be taken directly by staff and are not time or resource-intensive, preventing FW is relatively cheap.

The savings benefits from FW reduction programs go above and beyond the cost of their implementation. Several studies conclude that there are economic and efficiency reasons to reduce FW in the tourism sector.

The “Business Case for Reducing Food Loss and Waste” developed by Champions 12.3 is a first-of-its-kind study that analyzed nearly 1,200 business sites of more than 700 companies across 17 countries, representing a range of sectors, including hospitality (e.g., hotels, leisure). The analysis provides quantitative evidence from historical examples that there is a robust business case for countries, cities, and companies to take action to reduce FW.

Figure 23 | Key Findings of “The Business Case for Reducing Food Loss and Waste” (Champions 12.3)

GENERAL STUDY	
<ul style="list-style-type: none"> • 99% of the sites implementing FW reduction had a positive net financial return. • 14:1 is the median Benefit-Cost Ratio (BCR). • As the consumption stage is approached, the BCR increases. • Higher BCR if the establishment: (i) had not recently conducted any FW reduction effort; (ii) required only changes in practices; or (iii) needed low or no investment in equipment. 	
HOTELS	CATERING
<ul style="list-style-type: none"> • Return on Investment (ROI) 400% - 5:1 is the median benefit-cost ratio (7:1 mean) → on average a return of US\$7 for each US\$1 invested. 	<ul style="list-style-type: none"> • Return on Investment (ROI) 300%- 4:1 is the median benefit-cost ratio (6:1 mean) → on average a return of US\$6 for each US\$1 invested.
<ul style="list-style-type: none"> • Payback period 1 Year → 70% of the sites 2 Years → 95% of the sites 	<ul style="list-style-type: none"> • Payback period 1 Year → 64% of the sites 2 Years → 80% of the sites
<ul style="list-style-type: none"> • Economic impact - FW as a share of Cost of Goods Sold (COGS) decreased by 4 percentage points - 64% reduction in cost of FW 	<ul style="list-style-type: none"> • Economic impact - FW as a share of COGS decreased by 5 percentage points - 56% reduction in cost of FW
<ul style="list-style-type: none"> • Investment Under US\$20,000 over a three-year period in 90% of the sites. 	<ul style="list-style-type: none"> • Investment Under US\$15,000 over a three-year period in 98% of the sites.

Source: Developed by the authors based on Hanson, C., Mitchell, P. and Clowes, A. (2018).

Other studies support this conclusion:

- In a project conducted by the Rockefeller Foundation, WWF, and The American Hotel and Lodging Association (AH&LA) to test FW reduction strategies, the participating hotel chains - including Hilton, Hyatt, IHG, and Marriott International - reduced FW by up to 38% in 12 weeks (Naguib & Klatell, 2018).
- The “Roadmap to Reduce U.S. Food Waste by 20 Percent” was developed by ReFED to identify the most cost-effective solutions to cut FW at scale. This report includes a comprehensive list of over 27 possible FW solutions, categorized by prevention, recovery, and recycling in a ranked “marginal food waste abatement cost curve”. The curve shows that prevention initiatives (e.g., consumer education campaigns, waste tracking and analytics, smaller plates, etc.) are the most cost-effective and could lead to an annual business profit of US\$1.6 billion for restaurants and food service facilities (ReFED, 2016).

Putting Cost Analysis into Context

While FW reduction investments are efficient from a cost-benefit perspective, the absolute economic impact may not be significant enough in relation to the whole cost-structure of the business. Thus, strategic decision-makers may be tempted to prioritize other issues within their investment agendas. The associated costs of FW may end up buried in operational budgets, accepted as the “cost of doing business,” or considered not worth investment efforts.

Yet, all-inclusive hotels and cruises may face a different situation. Since offering abundant buffets is part of their operating model, FW represents a bigger portion of the all-inclusive business. Therefore, investing in FW reduction programs is very important to the CFOs of these companies since they offer huge opportunities for cost savings. At the same time, the all-inclusive operating model will likely need to adapt to public health concerns driven by the COVID-19 crisis, which may lead businesses to rethink the use of buffets.

Given that a cruise is a “floating all-inclusive hotel” without a fixed site, food service management (including purchasing, planning, production, service, and disposal) is much more complex. Enrique Laino, F&B Waste Manager at Royal Caribbean International, who was interviewed as part of this study, shared how the company is developing a tool using Artificial Intelligence (AI) to forecast food demand in order to generate economic savings by adjusting food production levels.

ii. Creating Social and Economic Value by Repurposing Food Waste

Instead of disposing of FW in a landfill, taking a circular economy approach that repurposes FW can generate additional social and economic benefits while contributing to corporate FW reduction targets and social responsibility efforts. One way of repurposing FW is by turning it into animal feed. For instance, Sinba, a Certified B Corporation based in Lima, Peru, developed a collaborative waste management solution whereby recycling associations collect organic waste from restaurants for a fee; the waste is then converted into pig feed and sold to small-scale informal pig breeders, who benefit from having access to a higher quality product. Inorganic recyclable materials (plastic, paper, cardboard, metal) are also collected by the recycling associations, generating additional income for wastepickers. Sinba’s growth since starting operations in 2017 shows that there is a business case in favor of reducing the amount of FW that ends up in a landfill.

Similarly, social value is created by recovering and redistributing food that has lost its commercial value. Businesses can donate surplus food that is fit for human consumption to local organizations such as food banks, instead of throwing it away. According to the Global FoodBanking Network, food banks acquire donated food, much of which would otherwise be wasted, from farms, manufacturers, distributors, retail stores, consumers, and other sources and make it available to those in need through an established network of community agencies. This global network includes food banks in over 40 countries that work locally to manage efficient food collection and distribution logistics.

iii. Reputational Returns and Stakeholder Engagement

Expectations are changing. Diverse stakeholders, from customers and employees to shareholders and investors, are increasingly demanding accountability from companies when it

comes to sustainability. This pressure is particularly notable among younger generations who want to feel a sense of purpose by working for - and being customers of - companies that are innovative and socially responsible. Likewise, millennials are traveling more than previous generations, and their preferences for authentic, personalized, and sustainable travel experiences are already influencing the tourism industry's evolution (OECD, 2018).

Millennials increasingly vote with their wallets. In Deloitte's 2019 Millennial Survey, 42% of respondents said that they have "begun or deepened a business relationship because they perceive a company's products or services to have a positive impact on society and/or the environment." And 37% said that they have "stopped or lessened a business relationship because of the company's ethical behavior." (Deloitte, 2019)

Therefore, incorporating FW reduction measures into broader sustainability strategies and reporting is one way for companies to show they are taking tangible action on issues that matter to society. This will not only help tourism sector companies from within by attracting and retaining talent, but also outwardly by building brand trust in the market. Moreover, taking the step to link sustainability reporting to the SDGs - for instance SDG target 12.3 related to FW - offers companies the opportunity to demonstrate how their efforts are contributing to the global development agenda.

Clearly, brand trust is a powerful currency in today's social media-driven landscape, particularly in consumer-facing sectors such as tourism. The recent public backlash against plastic straws pushed many companies, including the world's largest hotel company, Marriott, to ban their use. And the wider plastic movement²¹ continues to pressure companies to reduce plastic use on different fronts. A similar scenario could arise around the FW problem as it gains visibility and the potential for customer backlash grows.

Most of the blue-chip tourism companies interviewed as part of this study confirmed that they are investing in addressing FW as part of their sustainability programs or Corporate Social Responsibility (CSR) initiatives. Companies are also including FW initiatives in their marketing and communication strategies, showing awareness of the branding opportunity this offers. At the same time, there is room to strengthen current efforts towards investments with greater impact that are embedded in their core business.

This is especially important as investors are increasingly drawn to companies with solid environmental, social, and governance (ESG) track records. This enhanced ESG focus is driven by both the need to mitigate risks, such as those posed by climate change, as well as the desire to create value. It is estimated that roughly 25% of assets under management globally are invested with ESG considerations in mind (McKinsey, 2017). Therefore, investors can play an important role in the prioritization of sustainability issues such as FW by demanding that companies turn current isolated actions to address the problem into integrated FW management programs.

²¹ The plastic movement is a set of campaigns all over the world that work to reduce plastic production and consumption, redesign plastic products and improve plastic waste management.

CHAPTER 5

THE ROLE OF OTHER STAKEHOLDERS

The joint action of different stakeholders on various fronts is crucial to reduce FW in the tourism sector. Governments, the private sector, civil society, international organizations, multilateral development banks (MDBs), tourism associations, and tourists themselves must combine the power of action, influence, and synergies to tackle what is a collective problem. This chapter presents the complementary roles that different stakeholders can play in helping the tourism sector reduce FW, providing a number of examples from Latin America and other regions of the world.

A prime illustration of collective action is the Champions 12.3 coalition. Launched in 2016, the coalition brings together leading executives from governments, businesses, international organizations, research institutions, and civil society to mobilize action to reduce food loss and waste globally toward achieving SDG target 12.3. The Government of the Netherlands and the World Resources Institute (WRI) serve as the secretariat, coordinating meetings, research, and media outreach. Champions 12.3 has increased the visibility of the topic, producing and sharing evidence based on business cases and good practices.

Figure 24 | Examples of How Stakeholders Can Help the Tourism Sector Reduce Food Waste



5.1. Governments

The role of governments in developing regulatory and legal frameworks that facilitate the implementation of FW management measures in the tourism and other sectors is critical. Conducive policies, norms, and incentives at the national and local levels can both require and encourage businesses and citizens to reduce FW. The following are some actions that national and local governments can take to create regulatory frameworks which support FW management.

1. **Integrate FW into public policies and/or create institutionalized programs.** For example, Argentina approved a National Food Loss and Waste Reduction Program in 2015, followed by a National Plan for Food Loss and Waste Reduction in 2019²². These programs elevated the importance of the topic, facilitating the creation of specific budget items, the incorporation of the subject in public policies, and the continuity of actions across three government administrations to date.
2. **Enact FW laws.** Some countries and cities have enacted FW bans, requiring large commercial generators of FW to reduce and repurpose organic waste. In 2016, France approved a landmark law²³ banning large supermarkets from throwing away unsold food that could instead be donated. Supermarkets are required to sign agreements with food assistance organizations, helping to formalize the food donation process. Lack of compliance could result in fines. Italy also passed a law in 2016, which encourages supermarkets and restaurants to donate edible food to charities through a combination of tax incentives and simplified food donation procedures.²⁴ In the U.S., the State of Massachusetts banned the disposal of FW by establishments that generate a ton or more per week (MassDEP, 2014), and the City of Seattle²⁵, as well as the states of New York²⁶ and California²⁷, has made composting FW compulsory.
3. **Create laws and tax incentives to encourage food donation.** One way to support food donation is by ensuring liability protection for donors. The U.S. enacted the Good Samaritan Emerson law²⁸ in 1996 to facilitate food donation, and Argentina, Panama, Mexico, and Australia are among the countries that have followed suit. In addition, tax incentives can play a fundamental role in encouraging food donation, and the U.S. has one of the strongest systems in the world in this regard (FLPC, 2020).²⁹

²² For more information, see [Se reglamentó el Plan Nacional de Reducción de Pérdidas y Desperdicios de Alimentos y la Ley Donal](#).

²³ Law 2016-138 “La lutte contre le gaspillage alimentaire”.

²⁴ For more on the Italian FW law see: [Situation of Food Waste in Italy](#).

²⁵ In 2014, Seattle banned organic waste. The Seattle State Ordinance prohibits the dumping of food, food scraps and compostable paper along with other waste, establishing that a specific collection service must be contracted to ensure its treatment through composting, or carry out the treatment on site. (Seattle Public Utilities, 2014).

²⁶ Since 2015, the Commercial Organics Law obliges businesses to separate organic waste and treat it through composting, biodigestion or other method approved by the Municipality (ILSR, 2016).

²⁷ Law AB1826, Chapter 727, requires generators of organic waste of commercial origin to convert it into compost or transform it into energy through the anaerobic biodigestion process (HPCA, 2014).

²⁸ The law exempts the donor from civil and criminal liability for damages caused by the nature, age, packaging or condition of the donated food. As long as these were apparently in good condition and the donation was made in good faith.

²⁹ For more detail on liability protection and tax incentives for food donation in other countries see the [Global Food Donation Policy Atlas](#) developed by Harvard Law School Food Law and Policy Clinic and partners.

4. **Standardize date labels on packaged foods.** Since confusion over date labels contributes to consumer FW, efforts to standardize how labels are written can help reduce it. For example, the U.S. Food and Drug Administration is encouraging the food industry to adopt the wording “best if used by” on food labels to communicate the quality of food products. In contrast, products labeled with “sell by” or “use before” wording may be interpreted as being unsafe for consumption after that date, causing consumers to throw away safe, edible food.
5. **Promote the recycling of FW.** Food waste can be repurposed for energy, agricultural uses and other products. South Korea is a world leader in FW management, going from recycling 2% of its FW in 1995 to 95% in 2019 (WEF, 2019). The government has implemented a series of strategies and regulations for recycling FW into animal feed, compost, and biofuel. In 1995, Seoul revamped its waste collection system, making the pick-up of recycling free, but charging a fee for trash collection. In 2005, the country banned the dumping of FW in landfills. Households and businesses must separate FW at the source and dispose of it in special biodegradable bags placed in “smart bins”, which are weighed and charged per kilogram of organic waste (New Yorker, 2020).
6. **Regulate the compost market.** Many countries have created regulations for bio-waste management and compost production, such as separate collection of bio-waste and quality standards for heavy metals and impurities in compost. An efficient quality management system enables the production of high-quality compost, ensures reliability and trust, and facilitates the creation of a compost market (European Environment Agency, 2020). In the European Union, the Circular Economy Package introduced in 2015 followed by the adoption of revised directives for waste, landfills, and fertilizers in 2018 and 2019 has further strengthened the EU’s legislative framework in this regard. For example, with the revised EU Fertilizer Regulation in 2019, including harmonized criteria for compost, organic fertilizing products from recycled materials can be freely traded on the European fertilizer market (European Compost Network, 2019).

In addition to a regulatory role, governments can also help facilitate and finance public-private coordination and research efforts through multidisciplinary working groups, networks, and digital platforms. Working groups can be of great value in developing proposals around FW measures, and their work can inform legislation and regulations. To illustrate, the European Union Seventh Framework Programme funded the multistakeholder FUSIONS platform to generate a shared vision and strategy to prevent food loss and waste across the supply chain through social innovation. It was made up of 21 partners from 13 countries including universities, think tanks, consumer organizations, and companies. Active from 2012-2016, the work of this group culminated in a series of recommendations and guidelines to support the development and implementation of a common European FW policy framework.³⁰

³⁰ See FUSIONS, 2016. [Recommendations and guidelines for a common European food waste policy framework.](#)

5.2. Private Sector

By fostering innovative FW management solutions, the private sector plays a crucial role in helping tourism sector businesses reduce FW. Startups have been increasingly launched across the FW spectrum, including tech-driven solutions for waste prevention, recovery and recycling. For example, Leanpath offers smart scales, software, and behavioral coaching which allow kitchens to measure FW, track and analyze data, and identify opportunities for further prevention in the waste stream. Similarly, the latest technology offered by the company Winnow uses cameras and artificial intelligence to help commercial kitchens assess food that has been thrown away and why, estimate its cost, and optimize prevention measures. These tech-driven solutions are helping thousands of restaurants, hotels, and other hospitality sector businesses cut FW in half and reduce food costs by 2% to 8%.³¹

“We wouldn’t have achieved what we did without the private sector. Their involvement is vital to scale ideas and increase efficiency”. Caitrin O’Brien - Senior Manager, Corporate Sustainability at Hilton.

Also spurred by digital technologies, there is an expanding array of apps that connect surplus food from grocery stores, restaurants or other businesses with food assistance programs and customers willing to pay for it. While some of these are run by non-profit organizations managing food donations, others have been created by emerging companies. For example, the Danish company, Too Good To Go, has developed an app that connects over 22 million users in 15 mostly European countries with a network of over 45,000 restaurants, bakeries, hotels, and supermarkets with unsold food. Users are able to purchase surplus food from these businesses for a small fee. About 1,400 hotels are using the app, including the Accor Hotel Group. Since 2016, 500 of its hotels across 8 European countries have saved 160,000 meals and avoided over 440 tons of CO₂e by using this app.³²

Similarly, the Colorado-based U.S. startup FoodMaven offers an online marketplace that helps farmers, meat processors, and food distributors find a home for their ugly but perfectly edible produce and excess inventory that had previously gone to a landfill. Hotel companies such as Hilton have partnered with FoodMaven as part of their efforts to cut FW and expand sustainable sourcing from local producers.

The private sector also plays a key role in financing the creation and growth of these innovative market-based solutions. Large food corporations are joining the FW innovation space, seeking to invest in or acquire FW ventures to enhance their brand and gain a competitive edge. Corporate accelerator programs established at Chobani, Chipotle, and Maersk Ventures include FW as a focus. Similarly, other accelerators such as Food System 6, Food-X, and Rabobank’s FoodBytes! are fueling the emergence of innovators in this area.

In addition to incubation and acceleration support, there has been a clear increase in venture capital and private investment in FW management-related startups around the world. In 2018, FW startups raised a record US\$224 million in private investment in the U.S. alone through 30-plus deals, according to ReFED’s analysis of Crunchbase data. As of November 2019, ReFED had tracked another 14 deals, raising an additional US\$63 million (Forbes, 2019). Given the nascent stage of the

³¹ According to the websites of both companies. Accessed May 27, 2020.

³² Too Good to Go [Case Study](#). Accessed April 29, 2020.

FW solution market, private philanthropic funding from foundations continues to play an important catalytic role in testing and supporting the development of early-stage innovations.

5.3. Civil Society Organizations

CSOs are often the driving force behind efforts to raise awareness about the FW problem and change people's behaviors. They can play an important role in pushing companies and governments to set targets and measure FW, holding them accountable to these commitments. They are also practitioners that receive public, private, and philanthropic funding to pilot food waste solutions, implement capacity-building programs, foster multistakeholder partnerships, and generate and share knowledge and data.

In the U.S., an example of a leading multi-stakeholder nonprofit is ReFED, which is driven by influential business, nonprofit, foundation, and government leaders committed to reducing FW. It was launched in 2015 to develop the Roadmap to Reduce U.S. Food Waste, a first-of-its-kind economic analysis that identified specific opportunities to save money and resources, feed people, and create jobs by tackling the FW problem. It serves as a knowledge hub, offering an innovator database that tracks over 500 FW solutions, among other tools and research efforts that are helping stakeholders take action.

Also exemplifying the contributions of civil society in this arena, the Further with Food platform offers a diverse community of users – such as businesses, government entities, investors, CSOs, academics, and individuals – a space to “find and share information about proven solutions and innovative new approaches to reduce the volume of surplus food, feed hungry people, and divert food and scraps to the highest beneficial use.” It is supported by a public-private partnership comprised of various actors.

Other CSOs that are active in the FW space mentioned throughout this report include the World Resources Institute (WRI), which led the development of the Food Loss and Waste Protocol and the World Wildlife Fund (WWF), which has engaged the manufacturing, hospitality, retail, and food services sectors in research activities and demonstration projects through the Hotel Kitchen project. Finally, focusing on the tourism sector, CSOs are helping to mainstream FW into green certifications such as Biosphere Tourism, EarthCheck, Green Destinations, and Green Globe.

5.4. International Organizations

The role of international organizations is central for tackling FW worldwide, particularly in terms of raising awareness, collecting data, and generating information. Within the United Nations framework, FAO, the UNWTO, and UNEP are the main organizations involved.

Multilateral development banks (MDBs) have a role to play, too. They can finance specific initiatives, work with public sector partners on the policy front, or support the implementation of FW management actions with their private sector clients. For example, the Sin Desperdicio³³ platform launched by the Inter-American Development Bank in 2018 brings together leading companies and other partners committed to reducing food loss and waste in Latin America and the Caribbean. It

³³ Accessible at: <https://sindesperdicio.net/en/>

provides grant financing and incubation support for innovative solutions, supports public policy design and knowledge generation, and promotes responsible production and consumption.

MDBs can also address the issue through innovative financial products. For instance, in 2019 the World Bank launched the first Sustainable Development Bond (US\$300 million) to raise awareness about the importance of combating food loss and waste. By the end of 2019, it had issued 25 Sustainable Development Bonds to finance projects addressing FW, reaching a total of US\$2 billion. Investors included a range of banks, asset managers, insurance companies, and pension funds (World Bank, 2019).

5.5. Tourism Sector Associations

Within the tourism sector there are various associations that could increase the visibility of the FW problem, encourage innovation, and create synergies among their members.³⁴ For instance, the Pacific Asia Travel Association (PATA) developed BUFFET, a campaign to raise awareness through a website that includes information, resources, and an interactive toolkit to address FW at the hotel level.

Another initiative is Hotel Kitchen, led by the AH&LA. The project, which was developed in partnership with the WWF and supported by The Rockefeller Foundation, also included the participation of Hilton, Hyatt Hotels Corporation, Inter-Continental Hotels Group, Marriott International, Hershey Entertainment & Resorts, Sage Hospitality, and Terranea Resort. Ten hotel properties participated in the 12-week demonstration projects and tested different waste reduction strategies, including low-waste menu planning, staff training and education, and customer engagement. Overall, participating properties reduced FW by at least 10%, and some properties lowered food costs by 3% or more after increasing measurement and engagement. Along with publishing the results of those projects, the initiative developed a toolkit³⁵ with strategies to help hotel properties and brands meet measurable, time-bound goals to reduce FW.

5.6. Tourists

Finally, as tourists, individuals play a key role in tackling this problem by participating in the FW reduction initiatives proposed by hotels or cruises. They can also be more proactive and explicitly give positive – or negative – feedback on social networks or in hotel reviews about FW initiatives, or the lack thereof. This can help pressure companies to take action to protect their image. Social media influencers travelling around the world can raise awareness about the issue by highlighting both the amounts of FW at hotels and the innovative measures that some establishments are implementing to address it.

³⁴ For example: the International Congress and Convention Association, the Cruise Lines International Association, the Latin American Travel Association, the Adventure Tourism Research Association, the Association for the Promotion of Tourism to Africa, the Association for Tourism and Leisure Education, the European Tourism Association, the International Association for Tourism Economics, the International Coalition of Tourism Partners, and the World Travel and Tourism Council.

³⁵ See Annex C for a list of FW toolkits and other resources.

CHAPTER 6 OPPORTUNITIES FOR REDUCING FOOD WASTE IN LAC

The LAC region offers unique opportunities for reducing FW in the tourism sector. Not only is it home to some of the world’s top tourism destinations, but it also has other promising characteristics, such as the presence of strong food banking networks, a burgeoning entrepreneurial landscape, advancements on the legislation and national strategy front, and successful examples of FW management actions underway among hospitality businesses.

6.1. Tourism is a major economic driver in LAC

Tourism is a key economic engine for LAC. In 2019, tourism in Latin America represented 8% of GDP (US\$299 billion) and provided nearly 17 million jobs (8% of total employment). In the Caribbean, tourism is the most important economic sector in a number of countries, accounting for nearly 14% of that region’s GDP (US\$59 billion) and 2.8 million jobs (15% of total employment) (WTTC, 2020b). The impact of the COVID-19 pandemic underscores just how important this sector is for employment. Job loss estimates for 2020 range from 6 to 10 million for Latin America and from 1.6 to 2 million for the Caribbean (WTTC, 2020c).

Before the COVID-19 pandemic, the region’s tourism sector had been gaining competitiveness as an attractive destination. The region’s rich natural resources are its greatest asset, and improvements in international openness, price competitiveness, and information and communication technology have all helped to boost tourism in recent years (WEF, 2020).

The region is also home to major global resort, cruise, and tourist hubs, as shown in Figure 25 below. Cancun, Mexico, leads the way with over 6 million international tourist arrivals in 2018. In comparison, Bangkok was the most visited city in the world with 23 million arrivals, followed by Paris and London with around 19 million each (Mastercard, 2019a). Cozumel in Mexico and Nassau in The Bahamas are the top cruise ports in LAC and are among the top 10 busiest cruise ports in the world. Miami, Florida, is the world’s busiest cruise port with nearly 5 million tourist arrivals in 2016 (Cruise Industry News, 2017).

Figure 25 | Top 5 Cities and Ports in LAC by Annual Tourist Arrivals



Source: Mastercard (2019b); Cruise Industry News (2017).

As discussed in Chapter 4, tourist hubs concentrate large amounts of FW in small geographic areas.³⁶ This density can help facilitate economies of scale when it comes to implementing FW reduction measures, such as food donation programs across restaurants, hotels, and other tourism sector businesses. The concentration of FW can also make it economically viable for businesses to pursue other value-added processes such as producing animal feed, bioenergy, or composting, which are great examples of circular economy approaches.

6.2. Strong Food Banking Networks

Reducing FW in LAC and repurposing food for human consumption can address another pressing societal concern: food insecurity. Despite being one of the world's main breadbaskets, 6.5% of the region's population (42.5 million people) suffered from hunger³⁷ in 2018, marking the fourth consecutive year of rising hunger levels. Broken down by region, 5.7% of the population in Latin America and 18.4% of the population in the Caribbean suffer from hunger. In comparison, the rate in Africa is 19.9%. Moderate or severe³⁸ food insecurity has also increased in the region, reaching 187 million people in 2018, up from 155 million in 2014-2016 (FAO, PAHO, WFP and UNICEF, 2019).

One way to address food insecurity and the FW problem is through food recovery and redistribution programs such as food banks. Food banking has a strong presence in LAC³⁹ and has played a key role in meeting the increased demand for food during the coronavirus pandemic. The Global FoodBanking Network includes national food bank members from 16 countries in the region. For example, in Brazil, the national food bank network, Mesa Brasil SESC, served 1.4 million people across the country in 2019 with a network of 3,500 corporate partners from supermarkets and restaurants to farms and wholesalers (SESC, 2019).

Similarly, in Mexico, the national food bank network, Bancos de Alimentos de México (BAMX), and its 55 member organizations served over 1.3 million people in more than 4,000 communities throughout the country in 2018 (BAMX, 2018). Its "Al Rescate" program allows BAMX to "rescue" cooked food fit for human consumption from hotels and restaurants by providing training to kitchen staff on safe food handling and packaging as well as a mobile app to report and coordinate food donations. Over 50 restaurants and 12 hotels, half of which are all-inclusive hotels such as the Iberostar⁴⁰ chain, are participating in the program, which has served over 250,000 meals since 2014.

³⁶ For example, Cancun has approximately 1,100 hotels in just 23 km.

³⁷ Hunger refers to chronic undernourishment.

³⁸ Moderate food insecurity: People experiencing moderate food insecurity face uncertainties about their ability to obtain food and have been forced to compromise on the quality/quantity of food consumed. Severe food insecurity: People experiencing severe food insecurity have typically run out of food and, at worst, gone a day (or days) without eating.

³⁹ [The Global FoodBanking Network](#) lists 189 partner food banks in LAC countries.

⁴⁰ Through a [partnership formed with BAMX in 2018](#), all Iberostar hotels in Mexico will participate in Al Rescate, channeling surplus food to the local food bank in Quintana Roo.

6.3. Burgeoning Entrepreneurial Landscape and Emergence of FW Solutions

In recent years, innovative enterprises that leverage the power of technology to address social and environmental challenges have increasingly emerged across LAC. A number of these enterprises are focusing on FW, tackling different aspects of the problem from making food donation logistics more efficient to offering organic waste management solutions. The following list highlights those most relevant for the hospitality sector.

Name	Country(ies) of operation	Description
	Argentina and Puerto Rico	Social enterprise that creates affordable food markets for low-income people by rescuing edible food that is about to be discarded. Nilus operates as a digital platform that connects food retailers and producers with community kitchens, NGOs, and social organizations. Through a shared economy model and a network of professional drivers, Nilus offers door-to-door delivery at discounted prices. An on-line inventory allows social organizations to shop for food using a mobile app.
	Argentina	Mobile app that helps restaurants and other businesses sell their daily surplus food. Customers buy food at a discount and can either pick it up or have it delivered.
	Brazil	Online platform that aims to make food donations more efficient. It connects food donors with NGOs, manages inventory, and tracks indicators on the social, economic, and environmental impact of food waste. It also raises awareness and trains organizations in terms of nutrition and best practices in food processing.
	Peru	A certified B Corporation that offers a waste management solution for food businesses (restaurants, hotels, supermarkets) by collecting organic waste and converting it into animal feed. Sinba provides training and certification to food businesses to separate organic food waste at the source. In partnership with recycling organizations, the waste is collected and transported to their BioFactory for processing into high quality animal feed, which is sold to pig farmers in Lima.

While the strength of entrepreneurial ecosystems varies across countries, there has been a surge in the number of incubator and accelerator programs in the region aiming to support socially conscious, sustainability-minded entrepreneurs. These programs typically provide a combination of economic incentives, mentoring, networking, and co-working spaces to help turn innovative business models into investable companies. In the area of FW, the Sin Desperdicio platform launched by the IDB focuses on various fronts, including promoting new ideas through open innovation competitions and grant financing. It has held two challenges for innovative FW solutions to date in Argentina and Mexico, and is planning to launch additional challenges in Colombia and Central America.

At the same time, venture capital investment in Latin America has more than doubled every year from 2016 to 2019, reaching a peak of US\$4.6 billion in 2019 (LAVCA, 2020). Top sectors for investment include fintech, agtech, and biotech. Increasingly, private equity and venture capital managers active in the region are raising dedicated impact funds or are co-investing with impact fund managers in tech startups that tackle financial inclusion, healthcare, agriculture, and education (LAVCA, 2018). While still accounting for a small portion of overall investment, impact investing has grown steadily in LAC, representing an estimated US\$4.7 billion in assets under management in 2017 (ANDE, LAVCA 2018). These trends signal mounting investor interest in impact-driven enterprises in the region, which could be an opportunity for increasing the ranks of FW solutions.

6.4. National Programs and Legal Frameworks for FW Reduction

Governments play a critical role in developing programs and legal frameworks conducive to FW prevention and reduction measures as well as food donation. For example, Chile established the National Committee for Food Loss and Waste Prevention and Reduction in 2017, to facilitate and coordinate public-private FW strategies, including elements of governance, awareness-raising campaigns, research, and technology solutions, among others. In 2015, Argentina created a National Programme for the Reduction of Food Loss and Waste. More than 80 public and private institutions, such as the *Federación Empresaria Hotelera Gastronómica de la República Argentina* (FEHGRA) and Costa Cruises, have since joined forces to form the National Network for the Reduction of Food Loss and Waste (FAO, 2019a). These efforts in Argentina have included a national communications campaign called “*Valoremos los Alimentos*”, which offers a guide for cities to implement FW strategies (World Bank, 2017). They also led to the updating of the country’s food donation law in 2018.⁴¹

More recently, additional countries in LAC are taking action to address the FW problem on the legislative front. As of 2019, six countries⁴² have drafted specific FW laws, and there are over 50 bills in progress. For example, both Colombia and Peru passed laws related to FW in 2019. These new laws include incentives for food donation, too, which

⁴¹ Law 27454 [Plan Nacional de Reducción de Pérdidas y Desperdicios de Alimentos](#).

⁴² Chile, Brazil, Costa Rica, Guatemala, Dominican Republic, and Paraguay. In the case of Chile, the draft law is a proposed update to the current Sanitary Code regarding food disposal.

is important for further strengthening food banking networks and encouraging more businesses to participate as well as for sparking entrepreneurial innovation in this space. Similarly, in 2019, 11 countries in LAC created cross-sector working groups to assess regulatory proposals and build public-private partnerships around FW action. The Parliamentary Front against Hunger in Latin America and the Caribbean⁴³, an initiative that brings together legislators from across the region, is playing a key role by supporting countries in the adoption, regulation and implementation of these laws in coordination with the relevant public agencies (FAO, PAHO, WFP and UNICEF, 2019).

Such momentum around introducing FW legislation across the region shows that the issue is gaining traction, which can help pave the way for greater uptake of FW prevention and reduction measures in sectors such as tourism. However, despite advances, regulatory challenges remain. For instance, tourism sector businesses in many countries in the region face barriers when it comes to pursuing food donation as an FW reduction measure.

A case in point is the Italian company Costa Cruises, which launched an FW recovery program in Europe whereby food suitable for human consumption is donated to local food banks at each stop. The company tried to replicate this initiative in an eight-night cruise that leaves from Argentina (Buenos Aires) and sails along the Brazilian and Uruguayan coasts, but faced legal barriers. According to María Cecilia Bersuker of Costa Cruises, who was interviewed for this report, food donation regulations in Europe made the process easy. The company simply had to translate the procedural manuals and meet the local food banks to coordinate deliveries. The company tried to take a similar approach in LAC by having the ship's F&B Department head meet with representatives from the Argentine Food Banking Network. However, Argentina's *Servicio Nacional de Sanidad y Calidad Agroalimentaria* (SENASA) does not allow ships, cruises, airlines, or other tourism companies to donate food that has entered the country from abroad. Since the food originated in Europe, Costa Cruises was not able to donate it.

Similarly, the Dominican Republic Food Bank tried to carry out an initiative to recover surplus food from hotels and redistribute it to social organizations. This effort failed due to a lack of legislation around food donation, such as a Good Samaritan Law. According to Julien Bulliard, a former member of the food bank who was interviewed for this report, since there is still no legal protection for donors, most institutions are reluctant to donate. Currently, the National Committee for Prevention and Reduction of Food Losses and Waste in the Dominican Republic is working with FAO to prepare a protocol for regulating food donation (FAO, 2019b).

6.5. Examples of Food Waste Management in the Tourism Sector

While FW management remains a challenge in the LAC tourism sector, some hospitality businesses are already addressing the issue by repurposing FW through circular economy approaches, offering an opportunity for other companies and local governments to learn from their experience and take similar actions.

For example, a hotel in Puerto Vallarta, Mexico, is donating about 700 pounds worth of

⁴³ For more information, see <http://parlamentarioscontraelhambre.org/en/about-us/>

organic FW to a local hog farmer every day and is composting the rest on site to use as fertilizer for its gardens (NPR, 2018). Also in Mexico, to divert organic waste from Tulum's already overwhelmed landfills, a restaurant owner and chef started an organization called Woolis Solutions to collect organic FW from hotels and restaurants for a monthly fee. The organic material is either used for animal feed or composted on a local farm and used as fertilizer to grow produce that will be served in local hotels and restaurants (Mexico News Daily, 2019). During high season, they collect around two tons of organic waste daily. In Brazil, a luxury hotel in Rio de Janeiro has been an FW management pioneer since 2008. Today, it recycles more than 1,800 gallons of cooking oil and composts nearly all of its FW (NPR, 2018).

In other cases, hotel developers are building new projects with FW management in mind. The Hotel La Compañía project in Panama City, set to open in 2022, consists of the restoration and conversion of a 17th century Jesuit mission in the city's historic center into a mixed-use hotel, restaurants, and retail space. In an interview conducted for this report with hospitality sector veteran and Managing Director of Hotel La Compañía, Christopher James Lenz, he underscored the importance of FW management as an economic incentive. Businesses that produce excessive FW lose money, which is a reflection of poor management. In his view, a hotel's value should include FW prevention as an integral part of the business.

To this end, he is planning to implement various FW measures at La Compañía in order to increase revenues and improve client service, including offering only a la carte service (no buffets) and placing one chef in charge of planning both the hotel restaurants' and staff menus to utilize surplus food from the restaurant inventory. The hotel will also closely monitor the cost and quantities of dishes sold to identify high cost/low volume menu items that may need to be reengineered. This will help it maintain high inventory turnover, which is key for ensuring high-quality, fresh products and less FW.

Finally, hotels are also partnering with tech-driven startups as part of their FW management strategies. For example, Argentine startup Nilus offers a digital marketplace that connects food retailers and producers with products at risk of being wasted to non-profit organizations, and manages deliveries through a network of authorized drivers. Nilus is partnering with Marriott World Central Kitchen and the Clinton Foundation in Puerto Rico⁴⁴ to pilot its food rescue model and optimize this service for hotels. While the pilot has been put on hold due to COVID-19, its initial results are promising. In the first three months of 2020, seven food rescues were carried out, saving over 1,100 pounds of edible food from being thrown away. In addition, hotel managers have connected Nilus with Marriott's network of local food distributors and producers, showing that hotels can play an important role as champions of FW initiatives. In fact, as the hospitality sales channel abruptly shut down due to the pandemic, local food distributors and companies left with surplus products increased the amount of food offered to the Nilus marketplace.

⁴⁴ [Fighting Malnutrition with Crowdsourcing Technology](#)

CONCLUSION

On one hand, the outlook for the tourism sector is stark in the wake of the global COVID-19 pandemic. The WTTC estimates that in 2020, up to 198 million tourism jobs are at risk, with a potential loss of US\$3.4 to US\$5.5 trillion in GDP (WTTC, 2020c). This situation is especially dire for developing countries that are heavily dependent on tourism.

As many tourism businesses focus on survival and prioritize liquidity needs to ensure that they can withstand a prolonged recovery, FW is understandably not a top priority. However, this drastic disruption in tourism activity offers an opportunity to take stock and consider FW measures as a way to improve operating margins and redirect the sector's path towards a more socially inclusive and environmentally sustainable future.

Taking action to prevent and reduce FW is just one important step among many that the tourism sector can take to further embed sustainability moving forward. Major hotels such as Marriot and Hilton have already committed to halving their FW by 2025 and 2030, respectively, sending a strong signal to the market. For LAC in particular, its rich natural resources are its top tourism asset, making strengthening environmental sustainability a fundamental part of the sector's recovery and long-term competitiveness.

As the world gradually reopens its doors to travel and tourism, hotels, cruises, and other hospitality businesses are already implementing new post-pandemic operating procedures, including biosecurity protocols and adjustments to food and beverage components. For instance, the ubiquitous hotel breakfast buffet is being rethought to address physical distancing requirements and health and safety concerns. This reimagining of self-service buffets through reduced food stations and portion control by hotel servers is just one way to reduce FW.

Likewise, as hospitality businesses regain their footing and try to remain competitive as the tourism sector gradually reignites, integrating FW prevention and reduction measures can help cut costs, improve operating margins, and attract increasingly sustainability-conscious tourists.

The world's FW problem is not new. But the crisis has elevated the twin issues of FW and food security as never before, offering a prime opportunity to tackle both. The tourism sector is a good place to start, and LAC has the opportunity to become a testing ground where lessons can be learned to inform efforts in other regions.



REFERENCES

- Airbnb.** (2019). *Airbnb Hosts Share More Than Six Million Listings Around the World*. <https://news.airbnb.com/airbnb-hosts-share-more-than-six-million-listings-around-the-world/>
- ANDE, LAVCA.** (2018). *The Impact Investing Landscape in Latin America*. https://lavca.org/wp-content/uploads/2018/10/UPDATEDAF_ASPEN_Summary_LATAM_ENG_2018_Digital_19outubro.pdf
- BAMX.** (2019). *Informe Annual 2018*. <https://www.bamx.org.mx/wp-content/uploads/2020/03/4.-INFORME-2018.pdf>
- Barclays.** (2019). *Food Waste: Ripe for Change*. https://www.sonoco.com/sites/default/files/2019-06/Barclays_Sustainable__Thematic_Investing_Food_Waste_Ripe_for_Change.pdf
- Boston Consulting Group (BCG).** (2018). *Tackling the 1.6-billion-ton Food Loss and Waste Crisis*. <https://www.bcg.com/publications/2018/tackling-1.6-billion-ton-food-loss-and-waste-crisis>
- CLIA.** (2019). *The Contribution of the International Cruise Industry to the Global Economy in 2018*. <https://cruising.org/-/media/research-updates/research/global-cruise-impact-analysis---2019--final.pdf>
- Cruise Industry News.** (2015). *Cruise Industry News Annual Report*. https://static.hosteltur.com/app/public/uploads/img/articles/2015/07/01/L_5b14fdfbca818_Cruise_industry_report_1000.jpg
- Cruise Industry News.** (2020). *Cruise Industry 2020*. <https://www.cruiseindustrynews.com/flip/cina2020/mobile/index.html#p=4>
- Deloitte.** (2019). *The Deloitte Global Millennial Survey 2019*. <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/About-Deloitte/deloitte-2019-millennial-survey.pdf>
- European Compost Network.** (2019). *Compost Production in Europe*. https://www.compostnetwork.info/wordpress/wp-content/uploads/190823_ECN-Compost-Production-in-Europe_final_layout-ECN.pdf
- European Environment Agency.** (2020). *Bio-waste in Europe – turning challenges into opportunities*. <https://www.eea.europa.eu/publications/bio-waste-in-europe/download>
- FAO.** (2011). *Global food losses and food waste - Extent, causes and prevention*. Rome: UN. <http://www.fao.org/3/a-i2697e.pdf>
- FAO.** (2013). *Food Wastage Footprint: Impacts on Natural Resources, Summary Report*. <http://www.fao.org/3/i3347e/i3347e.pdf>
- FAO.** (2013). *Toolkit: Reducing the Food Wastage Footprint*. <http://www.fao.org/3/i3342e/i3342e.pdf>
- FAO.** (2014). *Food Losses and Waste in Latin America and the Caribbean*. <http://www.fao.org/3/a-i3942e.pdf>
- FAO.** (2014). *Food Wastage Footprint: Full-Cost Accounting, Final Report*. <http://www.fao.org/3/a-i3991e.pdf>
- FAO.** (2015). *Food Wastage Footprint & Climate Change*. <http://www.fao.org/3/a-bb144e.pdf>
- FAO.** (2017). *The future of food and agriculture – Trends and challenges*. Rome. <http://www.fao.org/3/a-i6583e.pdf>
- FAO.** (2019a). *The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction*. Rome. Licence: CC BY-NC-SA 3.0 IGO. <http://www.fao.org/3/ca6030en/ca6030en.pdf>
- FAO.** (2019b). *República Dominicana elabora protocolo para regular donación de alimentos*. <http://www.fao.org/republica-dominicana/noticias/detail-events/es/c/1181149/>
- FAO, PAHO, WFP and UNICEF.** (2019). *Regional Overview of Food Security and Nutrition in Latin America and the Caribbean 2019*. Santiago. 135. <https://doi.org/10.4060/ca6979en>

- Fernández Miranda, R.** (2012). *Lo que hunden mientras flotan. Auge y análisis crítico del turismo de cruceros en la globalización*. Alba Sud. <http://www.albasud.org/publ/docs/56.pdf>
- FLPC.** (2020). *The Global Food Donation Policy Atlas. Executive Summary: United States*. <https://www.foodbanking.org/wp-content/uploads/2020/06/USA-Executive-Summary-05.29.20.pdf>
- Food Loss & Waste Protocol.** (2016). *The Food Loss and Waste Accounting and Reporting Standard*. Washington, DC. https://flwprotocol.org/wp-content/uploads/2017/05/FLW_Standard_final_2016.pdf
- Forbes.** (2019). *Food Waste Startups Like FoodMaven Are Getting More Investor Attention Than Ever*. <https://www.forbes.com/sites/andriacheng/2019/12/12/ugly-produce-no-more-food-waste-startups-are-hotter-than-ever/#774f9d262ab2>
- Gonzalez Vagué, L.** (2017). *French and Italian Food Waste Legislation: An Example for other EU Member States to Follow? European Food and Feed Law Review*. https://www.researchgate.net/publication/318039390_French_and_Italian_Food_Waste_Legislation_An_Example_for_other_EU_Member_States_to_Follow
- GSTC.** (2016). *GSTC Hotel Criteria*. https://www.gstcouncil.org/wp-content/uploads/2015/11/GSTC-Hotel_Industry_Criteria_with_hotel_indicators_21-Dec-2016_Final.pdf
- Hanson, C., Mitchell, P. & Clowes, A.** (2018). *The Business Case for Reducing Food Loss and Waste: Hotels*. Washington, DC: Champions 12.3. <https://champions123.org/sites/default/files/2020-08/business-case-reducing-food-loss-and-waste-hotels.pdf>
- Hanson, C., Mitchell, P. & Clowes, A.** (2018). *The Business Case for Reducing Food Loss and Waste: Catering*. Washington, DC: Champions 12.3. <https://champions123.org/sites/default/files/2020-07/business-case-reducing-food-loss-waste-catering.pdf>
- HLPE.** (2014). *Food losses and waste in the context of sustainable food systems*. Rome. <http://www.fao.org/3/a-i3901e.pdf>
- HPCA.** (2014). *Mandatory Commercial Organics Recycling (AB 1826)*. <https://www.hpca.gov/680/Mandatory-Commercial-Organics-Recycling>
- Holt-Giménez, E., Shattuck, A., Altieri, M., Herren, H., & Gliessman, S.** (2012). *We Already Grow Enough Food for 10 Billion People ... and Still Can't End Hunger*. *Journal of Sustainable Agriculture*, 36:6, 595-598. <https://doi.org/10.1080/10440046.2012.695331>
- Hotel Kitchen.** (2017). *Fighting Food Waste in Hotels*. https://c402277.ssl.cf1.rackcdn.com/publications/1112/files/original/Hotel_Kitchen_Final.pdf?1510541742
- Hotels Magazine.** (2020). *Special Report. Hotels 325 Rank. September/October 2020*. <http://library.hotelsmag.com/publication/?m=18556&l=1>
- ICCA.** (2018). *ICCA Statistics Report 2018*. <http://www.iccaworld.org/dcps/doc.cfm?docid=2321>
- ILSR.** (2016). *NYC - Commercial Organics Recycling Mandate*. <https://ilsr.org/rule/food-scrap-ban/nyc-organics-recovery/>
- Investopedia.** *Return on Investment*. Retrieved November 2019 www.investopedia.com/terms/r/returnoninvestment.asp
- Investopedia.** *Payback Period*. Retrieved November 2019 www.investopedia.com/terms/p/paybackperiod.asp
- Investopedia.** *Benefit-Cost Ratio - BCR Definition*. Retrieved November 2019 www.investopedia.com/terms/b/bcr.asp
- LAVCA.** (2018). *Impact+Tech/VC Investing: Latin America Snapshot*. <https://lavca.org/wp-content/uploads/2018/10/Impact-Breakout-Report-FINAL-10.30.18.pdf>
- LAVCA.** (2020). *Annual Review of Tech Investment in Latam*. <https://lavca.org/industry-data/inside-the-4th-consecutive-peak-year-lavcas-annual-review-of-tech-investment-in-latam/>
- MassDEP.** (2014). *Commercial Organic Materials Waste Ban Guidance for Businesses, Institutions, and Haulers*. <https://www.mass.gov/doc/guidance-for-businesses-institutions-haulers-commercial-organic-materials-waste-ban/download>

- Mastercard.** (2019a). *Global Destination Cities Index 2019*. <https://newsroom.mastercard.com/wp-content/uploads/2019/09/GDCI-Global-Report-FINAL-1.pdf>
- Mastercard.** (2019b). *Los destinos más populares de America Latina y el Caribe*. <https://newsroom.mastercard.com/latin-america/es/press-releases/10-anos-despues-los-destinos-mas-populares-en-america-latina-y-el-caribe/>
- McKinsey.** (2017). *From 'Why' to 'Why Not': Sustainable Investing as the New Normal*. <https://www.mckinsey.com/industries/private-equity-and-principal-investors/our-insights/from-why-to-why-not-sustainable-investing-as-the-new-normal>
- Mexico News Daily.** (2019). *The restaurateur who's turning Tulum's waste into a compost farm*. <https://mexiconewsdaily.com/mexicolife/turning-tulums-waste-into-a-compost-farm/>
- Naguib, D., & Klatell, D.** (2018). *Tackling Food Waste in Hotels: Q&A with Marriott International*. <https://www.rockefellerfoundation.org/blog/tackling-food-waste-hotels-qa-marriott-international/>
- New Yorker.** (2020). *How South Korea is Composting Its Way to Sustainability*. <https://www.newyorker.com/magazine/2020/03/09/how-south-korea-is-composting-its-way-to-sustainability>
- Nguyen, L.** (2018). *Food waste management in the hospitality industry - Case study: Clarion Hotel Helsinki*. Haaga-Helia University of Applied Sciences. https://www.theseus.fi/bitstream/handle/10024/142528/NGUYEN_KHANH%20LINH.pdf?sequence=1&isAllowed=y
- NPR.** (2018). *How Luxury Hotels and Restaurants in Developing Countries Fight Food Waste*. <https://www.npr.org/sections/thesalt/2018/07/20/628206194/how-luxury-hotels-and-restaurants-in-developing-countries-fight-food-waste>
- OECD.** (2008). *OECD Glossary of Statistical Terms*. <http://stats.oecd.org/glossary/glossary.pdf>
- OECD** (2018). *Tourism Trends and Policies*. https://www.oecd-ilibrary.org/urban-rural-and-regional-development/oecd-tourism-trends-and-policies-2018_tour-2018-en
- OECD & FAO.** (2015). *OECD-FAO Agricultural Outlook 2015-2024*, OECD Publishing, Paris. <http://www.fao.org/3/a-i4738e.pdf>
- ReFED.** (2016). *Roadmap to Reduce U.S. Food Waste by 20 Percent*. https://www.refed.com/downloads/ReFED_Report_2016.pdf
- Schein, S. & Bellinson, B.** (2016). *Food Waste Opinion Leaders Study*. https://furtherwithfood.org/wp-content/uploads/2017/12/Food_Waste_Opinion_Leaders_Study_Bellinson_and_Co_10192016.pdf
- Seattle Public Utilities.** (2014). *Ordinances Prohibiting Recyclables and Compostables in Garbage*. <https://www.seattle.gov/utilities/businesses-and-key-accounts/solid-waste/garbage/commercial/ban-ordinance>
- SESC.** (2019). Retrieved from <http://www.sesc.com.br/portal/site/mesabrasilsesc/home/>
- Statista.** (2019). *Hotel industry - Statistics & Facts*. <https://www.statista.com/topics/1102/hotels/>
- UN & WTO.** (1994). *Recommendations on Tourism Statistics*. New York: UN. https://unstats.un.org/unsd/publication/Seriesm/SeriesM_83e.pdf
- UNCTAD.** (2010). *The contribution of tourism to trade and development*. https://unctad.org/en/Docs/cid8_en.pdf
- UNWTO.** (2011). *Tourism Towards 2030: Global Overview*. https://www.globalwellnesssummit.com/wp-content/uploads/Industry-Research/Global/2011_UNWTO_Tourism_Towards_2030.pdf
- UNWTO & UNEP.** (2008). *Climate Change and Tourism: Responding to Global Challenges*. https://books.google.com/books?id=C_4gBTp-ioYC&printsec=frontcover&hl=es&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
- US EPA.** (2014). *Food Waste Management Scoping Study*. https://www.epa.gov/sites/production/files/2016-01/documents/msw_task11-2_foodwastemanagementscopingstudy_508_fnl_2.pdf
- WEF.** (2019). *South Korea once recycled 2% of its food waste. Now it recycles 95%*. <https://www.weforum.org/agenda/2019/04/south-korea-recycling-food-waste/>

- WEF.** (2020). *Latin America and Caribbean Travel & Tourism Competitiveness Landscape Report: Assessing Regional Opportunities and Challenges in the Context of COVID-19*. http://www3.weforum.org/docs/WEF_LAC_Tourism_Compert_Report_2020.pdf
- Winnow.** (n.d.). *Addressing Food Waste in the Hospitality and Foodservice Sector*. https://www.foodwastepledge.ae/s/Insight-Report_Winnow.pdf
- World Bank.** (2017). *Valoremos los Alimentos - Guía Integral para Municipios*. <http://documentos.bancomundial.org/curated/es/983881506584850729/We-value-food-comprehensive-guide-for-municipalities>
- World Bank.** (2019). *World Bank Reaches \$2 Billion in Sustainable Development Bonds Issued while Raising Awareness for Food Loss and Waste with Strong Support from Japanese Investors*. <https://www.worldbank.org/en/news/press-release/2019/12/05/pressreleaseworldbankreaches2billioninsdbissuedwhileraisingawarenessfor-flwwithstrongsupportfromjapaneseinvestors>
- World Bank.** (n.d.). *World Bank Open Data*. <https://data.worldbank.org/>
- WRAP.** (2011). *The Composition of Waste Disposed of by the UK Hospitality Industry*. http://www.wrap.org.uk/sites/files/wrap/The_Composition_of_Waste_Disposed_of_by_the_UK_Hospitality_Industry_FINAL_JULY_2011_GP_EDIT.54efe0c9.11675.pdf
- WRAP.** (2013). *Overview of Waste in the UK Hospitality and Food Service Sector*. <http://www.wrap.org.uk/sites/files/wrap/Overview%20of%20Waste%20in%20the%20UK%20Hospitality%20and%20Food%20Service%20Sector%20FINAL.pdf>
- WRAP.** (2013). *The True Cost of Food Waste within Hospitality and Food Service*. <http://www.wrap.org.uk/content/true-cost-waste-hospitality-and-food-service>
- WTTC.** (2019). *Travel & Tourism: Economic Impact 2019 World*. <https://www.wttc.org/-/media/files/reports/economic-impact-research/regions-2019/world2019.pdf>
- WTTC.** (2020a). *Economic Impact Report 2020*. <https://wttc.org/Research/Economic-Impact>
- WTTC.** (2020b). *Caribbean 2020 Annual Research: Key Highlights*. <https://wttc.org/Research/Economic-Impact/moduleId/704/itemId/34/controller/DownloadRequest/action/QuickDownload>
- WTTC.** (2020b). *Latin America 2020 Annual Research: Key Highlights*. <https://wttc.org/Research/Economic-Impact/moduleId/704/itemId/42/controller/DownloadRequest/action/QuickDownload>
- WTTC.** (2020c). *Travel & Tourism Recovery Scenarios 2020 and Economic Impact from COVID-19*. <https://wttc.org/Research/Economic-Impact/Recovery-Scenarios-2020-Economic-Impact-from-COVID-19/moduleId/1474/itemId/103/controller/DownloadRequest/action/QuickDownload>

ANNEX A: GLOSSARY

Food Management

Food Loss and Waste

Food loss is the decrease in the quantity or quality of food resulting from decisions and actions by food suppliers in the chain, excluding retailers, food service providers and consumers. Food waste refers to the decrease in the quantity or quality of food resulting from decisions and actions by retailers, food service providers and consumers (FAO, 2019a).

Stages in the value chain

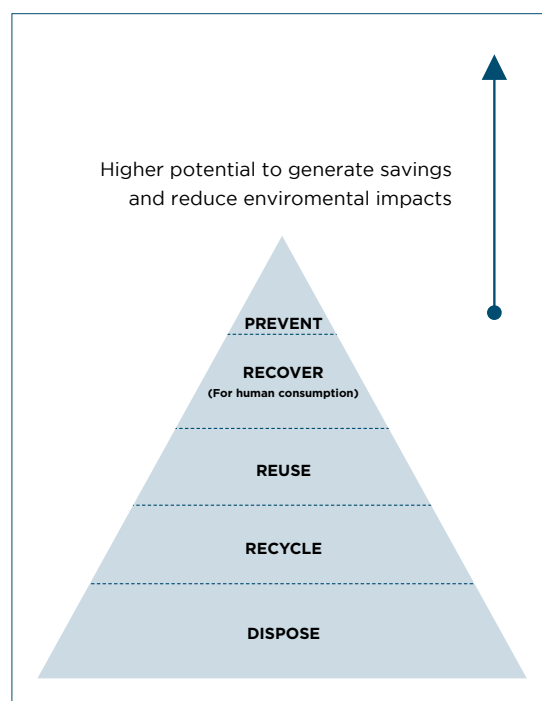
- **Production:** During or immediately after harvesting on the farm.
- **Handling and Storage:** After produce leaves the farm for handling, storage and transport.
- **Processing:** During industrial or domestic processing and/or packaging.
- **Retail and Distribution:** During distribution to markets, including losses at wholesale and retail markets.
- **Consumption:** In the home or business of the consumer, including restaurants, hotels and caterers.

Pyramid approach to food waste management

FAO, EPA, and other organizations working on the topic agree on the importance of prioritizing FW management measures. There are certainly some measures that are more effective than others in terms of the potential to reduce FW and its associated carbon footprint. Whenever possible, it is always better to prevent waste in the first place rather than reusing or recycling it.

- **Prevent:** Preventing the generation of food surplus should be the primary goal, as prevention generates the greatest positive impact, especially economic savings. Once the surplus is generated “there is no turning back”. The next step is determining the best course of action to avoid the landfill, but the expense of having bought and/or prepared these foods is already lost.
- **Recover for human consumption:** If surplus food is suitable for human consumption, the best course of action is donating or selling it to conserve its original purpose.
- **Reuse for animal feed:** If the food is not fit for human consumption, the next best alternative is to use it for livestock feed.

Figure 26 | Food Waste Management Hierarchy



- **Recycle:** This level includes the alternatives of biochemical processing, anaerobic and aerobic digestion, and controlled combustion. All of these processes alter the physical form of FW, and therefore consume more energy and resources than reusing FW.
- **Dispose:** Landfills should be the destination of last resort for FW, as it causes GHG emissions, among other environmental damages.

Travel and Tourism

Tourism

Activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited (OECD, 2008).

Domestic tourism

Tourism involving residents of one country traveling only within that country (OECD, 2008).

Total contribution to GDP

The total contribution of Travel & Tourism includes its 'wider impacts' (i.e. the indirect and induced impacts) on the economy (WTTC, 2019).

Direct contribution to GDP

The direct contribution reflects the 'internal' spending on Travel & Tourism (total spending within a particular country on Travel & Tourism by residents and non-residents for business and leisure purposes) as well as government 'individual' spending - spending by government on Travel & Tourism services directly linked to visitors, such as cultural (e.g. museums) or recreational (e.g. national parks) (WTTC, 2019).

Indirect contribution to GDP

The indirect contribution includes the GDP and jobs supported by: Travel & Tourism investment spending – an important aspect of both current and future activity that includes investment activity such as the purchase of new aircraft and construction of new hotels; Government 'collective' spending, which helps Travel & Tourism activity in many different ways as it is made on behalf of the 'community at large' – e.g. tourism marketing and promotion, aviation, administration, security services, resort area security services, resort area sanitation services, etc.; Domestic purchases of goods and services by the sectors dealing directly with tourists – including, for example, purchases of food and cleaning services by hotels, of fuel and catering services by airlines, and IT services by travel agents (WTTC, 2019).

Induced contribution to GDP

The induced contribution measures the GDP and jobs supported by the spending of those who are directly or indirectly employed by the Travel & Tourism industry (WTTC, 2019).

Economy and Finance

Gross Domestic Product (GDP)

Aggregate measure of production equal to the sum of the gross values added of all resident

and institutional units engaged in production and services (plus any taxes, and minus any subsidies, on products not included in the value of their outputs (OECD, 2008).

Return on Investment

Performance measure used to evaluate the efficiency of an investment or compare the efficiency of a number of different investments. ROI tries to directly measure the amount of return on a particular investment, relative to the investment's cost. To calculate ROI, the benefit (or return) of an investment is divided by the cost of the investment. The result is expressed as a percentage or a ratio (Investopedia, 2019).

Payback Period

The payback period refers to the amount of time it takes to recover the cost of an investment. Simply put, the payback period is the length of time an investment reaches a break-even point (Investopedia, 2019).

Benefit-Cost Ratio

Is an indicator used in cost-benefit analysis to show the relationship between the relative costs and benefits of a proposed project, expressed in monetary or qualitative terms. If a project has a BCR greater than 1.0, the project is expected to deliver a positive net present value to a firm and its investors (Investopedia, 2019).

Environment

Carbon Footprint

The carbon footprint of a food product is the total amount of greenhouse gases (GHG) emitted throughout its lifecycle, expressed in kg of CO₂-equivalents (CO₂e). GHG emissions of the production phase (including all agricultural inputs, machinery, livestock, soils) and successive phases (such as processing, transportation, preparation of food, waste disposal) are all included in this calculation (FAO, 2015).

CO₂e

As there are different greenhouse gases, CO₂e is a widely used unit of measure where GHG other than carbon dioxide, for example, methane, nitrous oxide, hydrofluorocarbons, are converted to their equivalent value in CO₂. This is obtained by multiplying the mass of the gas in question by its global warming potential.

Products hold different carbon intensities. For example, vegetable production in Europe is more carbon intensive than in industrialized and Southeast Asia, as Europe uses more carbon intensive means of production and one kg of wheat, or one kg of beef, have different carbon footprints, since their life cycles are different.

The whole lifecycle is included in the calculation. If a product was wasted at the consumption level it considers production phase, processing, transportation, preparation of food, waste disposal). The ratio 1 tn. food waste = 2,5 tn. CO₂e is simply an average.

ANNEX B: INTERVIEWS

Interviews with the following people were conducted as part of this report.

Nº	Name	Position	Institution	Purpose of the interview
1	Almendra Ortiz and team	Project Coordinator	Mexican Food Bank (BAMX)	Learn about the “Al Rescate” initiative to recover food from hotels and restaurants in Mexico.
2	Julien Bulliard	Ex Executive Director	Dominican Republic Food Bank	Understand why the donation initiative in Dominican Republic hotel chains failed.
3	Claudia Núñez Sánchez	Consultant	Hoteles Más Verdes	Information on hotel sustainability certifications.
4	María Cecilia Bersuker	Marketing Coordinator	Costa Cruises Argentina	Understand the success story of donating processed foods in Europe and the barriers to replicability in LAC.
5	Natalia Basso	Responsible for the FW Reduction Program	Ministry of Agriculture, Livestock and Fisheries of Argentina	Find relevant actors and success stories at regional level for future interviews.
6	Agustín Jimenez Rivarola	Co-founder	Tree Catering	Learn about FW in the catering industry from a management point of view.
7	Juan Cimino	Chef	Marshall Catering	Understand the dynamics of kitchen management in a catering company.
8	Caitrin O’Brien	Senior Manager of Corporate Sustainability	Hilton	Understand the involvement of one of the world’s largest hotel corporations in the subject.
9	Larissa Lopes	Sustainable Development Manager	Accor Hotels	Understand the involvement of one of the world’s largest hotel corporations in the subject.

10	Denise Naguib and team	Vice President, Sustainability and Supplier Diversity	Marriott	Understand the involvement of the world's largest hotel corporation in the subject.
11	Enrique Laino and team	F&B Waste Manager	Royal Caribbean International	Understand the involvement of one of the world's largest cruise chains in the subject.
12	Kai Robertson	Senior Corporate Sustainability Advisor	World Resources Institute (WRI)	Learn about the scope of the Standard developed by the Food Loss and Waste Protocol and next steps in terms of increasing uptake.
13	Nacho Rocafulll	New Business Exhibitions Manager	Feria Valencia and Forum Uruguay	Field Visit to Feria Valencia, to understand the business of convention centers and the opportunities to work on food waste. Explore opportunities to implement food waste management measures at Forum Uruguay.
14	John Pippett	Managing Director	Casicielo LLC	The interviewee is working on the development of West Resort Bocas de Toro (part of Casicielo Masterplan). The purpose was to analyze potential measures to manage food waste in the operational phase of the project.
15	Christopher James Lenz	Managing Director	Hotel La Compañía (Panama City)	The interviewee is leading the opening of the new boutique Hotel La Compañía and will be in charge of the operation. He has extensive experience in the hospitality sector. The purpose was to understand the challenges and opportunities of food waste management within a hotel's operations, as well as the FW measures that Hotel La Compañía will implement.

ANNEX C: ADDITIONAL RESOURCES

The following list is a selection of resources to help organizations better understand their FW drivers and design and implement FW management programs.

1. [Preventing Food Waste at the Buffet: A Guide for Managers and Chefs](#)
Leanpath, 2018
2. [Fighting Food Waste in Hotels](#)
Hotel Kitchen project, 2017
3. [¡Aprovechemos la comida! Una guía para reducir el despilfarro alimentario en el sector de la hotelería, la restauración y el catering](#)
Fundación Alicia and Autonomous University of Barcelona (UAB), 2013
4. [Sustainable Food Manual](#)
Futuoris, 2016
5. [Valoremos los alimentos: Manual para aprovechar al máximo los alimentos y evitar el desperdicio](#)
World Bank and the Ministerio de Producción y Trabajo de la Nación Argentina, 2017
6. [Foodservice Food Waste Action Guide](#)
Rethink Food Waste Through Economics and Data (ReFED), 2018
7. [BUFFET Toolkit](#)
Pacific Asia Travel Association (PATA), 2018