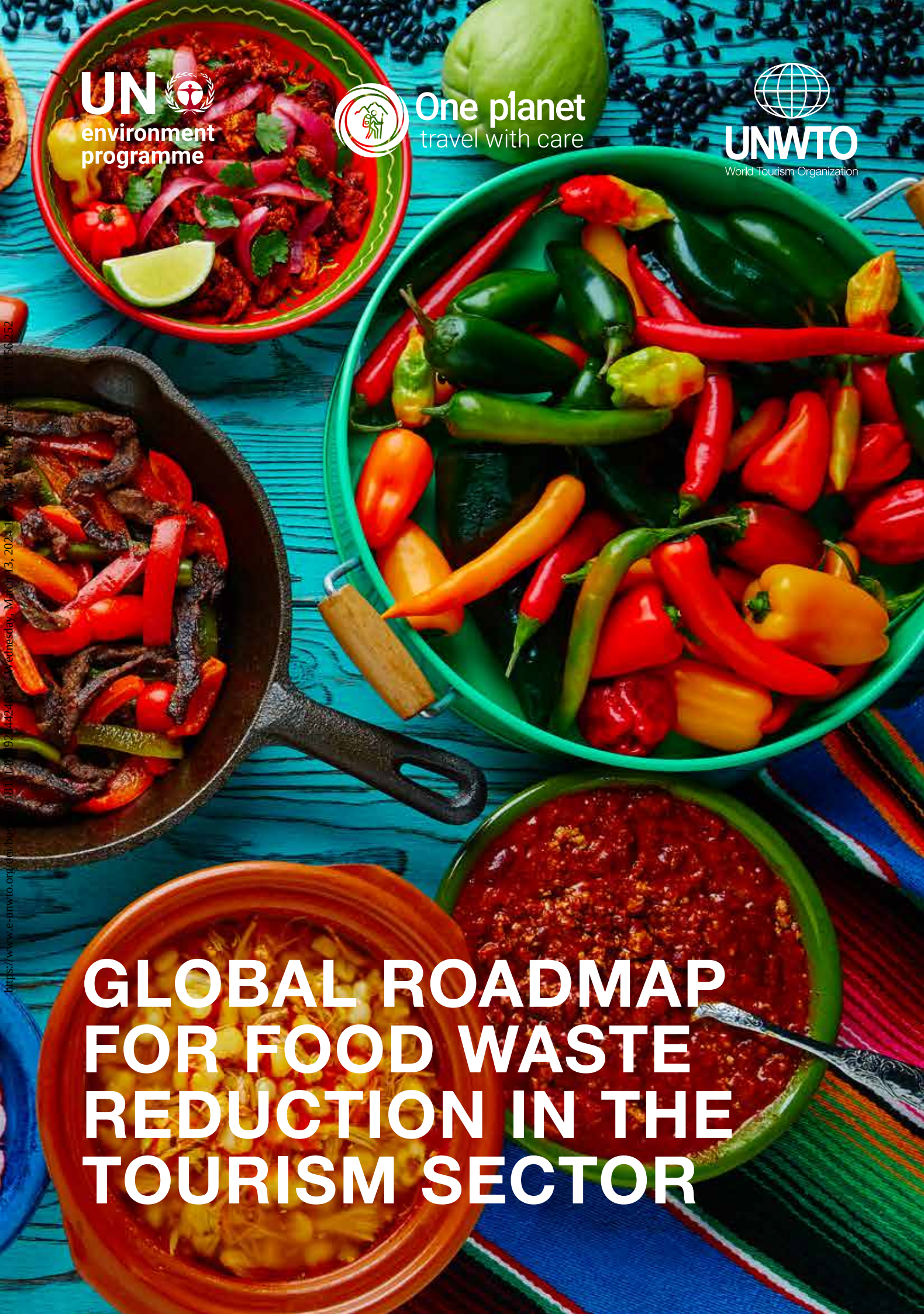

GLOBAL ROADMAP FOR FOOD WASTE REDUCTION IN THE TOURISM SECTOR

Global Roadmap for Food Waste Reduction in the Tourism Sector

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ISBN (printed version): 978-92-844-2407-8
ISBN (electronic version): 978-92-844-2408-5
DOI: 10.18111/9789284424085

Published by the World Tourism Organization (UNWTO), Madrid, Spain.
First printing: 2023

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Citation: World Tourism Organization (2023), *Global Roadmap for Food Waste Reduction in the Tourism Sector,* UNWTO, Madrid, DOI: https://doi.org/10.18111/9789284424085

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Foreword

by Zurab Pololikashvili
Secretary-General,
World Tourism Organization

I am proud to present the Global Roadmap for Food Waste Reduction in the Tourism Sector. Its launch could not be more timely, nor more relevant; an estimated one-third of all food produced globally is going to waste. Tourism is well-positioned to promote sustainable consumption and production and, as a sector, has a responsibility to set an example.

The World Tourism Organization (UNWTO), in close collaboration with the United Nations Environment Programme (UNEP), is leading the One Planet Sustainable Tourism Programme, which serves as the umbrella for the development of the Global Roadmap for Food Waste Reduction in the Tourism Sector. This important initiative is driven by the understanding that action on food waste must be an immediate priority for us. The Roadmap provides the framework within which tourism organizations can play their part whilst delivering benefits to their own operations, as well as to guests, the environment, and to the sector as a whole.

We have already made good progress. The importance of addressing food waste has been emphasized in the One Planet Vision for a Responsible Recovery from COVID-19 and in the UNWTO Recommendations for a Green Travel and Tourism Economy, both of which connect food waste with circularity. Now, the Global Roadmap for Food Waste Reduction in the Tourism Sector is aimed at providing an action framework to accelerate progress towards this vital goal, thereby promoting more sustainable food management practices.

By adopting the recommendations in the Roadmap, tourism stakeholders can not only reduce their environmental impact and contribute to the achievement of the Sustainable Development Goals, but can also improve business efficiency, reduce greenhouse gas emissions, and decrease costs. Indeed, accelerating sustainable consumption and production in the tourism sector is not only an environmental imperative but also a smart business decision that can help ensure long-term resilience.

I would like to extend my gratitude to everyone involved in the development and implementation of the Global Roadmap for Food Waste Reduction in the Tourism Sector. Your dedication and hard work have made it possible to create a practical and effective tool for the tourism sector.

Together, we can drive positive change and ensure a more sustainable and prosperous future for all.

Acknowledgements

The Global Roadmap for Food Waste Reduction in Tourism has been developed within the framework of the One Planet Sustainable Tourism Programme by the World Tourism Organization (UNWTO) with technical assistance from the United Nations Environment Programme (UNEP) and in collaboration with the Waste and Resources Action Programme (WRAP) and the World Wildlife Fund (WWF).

The Roadmap is one of the deliverables of the Joint Programme on "Promoting sustainable food consumption and production patterns through integrated tools, advocacy and multi-stakeholder action" which was funded by the Multi-Partner Trust Fund for Sustainable Development Goal (SDG) 12 and where the Food and Agriculture Organization of the United Nations (FAO), UNEP, the United Nations Development Programme (UNDP) and UNWTO collaborated.

Under the overall guidance of Zoritsa Urosevic, Virginia Fernandez-Trapa led the research and coordination of the Roadmap, with the supervision of Dr. Dirk Glaesser, the support of Roxana Ashtari and in close collaboration with Svitlana Mikhalyeva from the One Planet Sustainable Tourism Programme (UNEP). WRAP and WWF provided technical advice to the project. A participatory approach was followed involving the members of the One Planet Sustainable Tourism Programme's Advisory Group on Food Waste in a series of consultation meetings held during 2021 and 2022 with support from UNEP and the French Ministry of Ecological Transition. The final draft of the Roadmap was released for public consultation at the 7th UNWTO World Forum on Gastronomy Tourism held in Nara, Japan in December 2022, with additional contributions from stakeholders being integrated during the first months of 2023..

Special thanks are extended to Jorge Laguna-Celis, Helena Rey, Libera Zizai Assini, Gina Torregroza, Clementine O'Connor, Marina Bortoletti , Carmen Torres Ledezma and Pablo Marengo (UNEP); Divine Njie, Siobhan Kelly and Pablo García-Campos (FAO); Tim Scott, Kathleen Wood and Pascale Bonzom (UNDP); Marcel Leijzer, Sandra Carvao, Maria Soledad Gaido, Chloe Bougeard and Klara Nordström (UNWTO); Hugh Jones, Sam Gillik-Daniels, Claire Kneller and Eleanor Morris (WRAP); as well as Samantha Kenny and Pete Pearson (WWF).

We also thank the following experts for their invaluable insights and advice during the development of this Roadmap:

Hugh Felton and Carolyn Wincer, *ABTA– The Travel Association*
Delphine Stroh and Anaelle Besset, *Accor*
Hansjörg Kunze and Beate Moeller, *Aida Cruises*
Masaru Takayama, *Asian Ecotourism Network*
Cinta Lomba and Iñaki Gaztelumendi, *Basque Culinary Center*
Hubert Vendeville, *Betterfly*

Kees Jan Boonen and Thomas Loughlin, Booking.com
Agnes Weil and Florian Duprat, *Club Med*
Alessandra Grillo, Claudia Rivola, Davide Triacca and Luisa Gullini, *Costa Cruises*
Nicole Ouimet-Herter and Simone Targetti Ferri, *Disneyland Paris*
Naut Kusters, *European Centre for Ecological and Rural Tourism (ECEAT)*
Jesus Alquezar Sabadie, *European Commission*
Anika de la Flor and Caitrin O'Brien, *Four Seasons Hotels and Resorts*
Ariel Roi, Randy Durband and Tiffany Chan, *Global Sustainable Tourism Council (GSTC)*
Eric Ricaurte and Jasline Ng, *Greenview*
Paulina Godfrey and Ella Pearson, *Hilton*
Marie Fukudome, *Hyatt*
Megan Morikawa, Gabriel Martorell and Sandra Benbeniste, *Iberostar*
The Corporate Responsibility Team, *InterContinental Hotels Group*
Dagmar Lund-Durlacher, *Institute for Tourism Sustainability*
Jon Godson and Daniela Stange, *International Air Transport Association (IATA)*
Stephane Leroux and Thomas Candeal, *International Food Waste Coalition*
Diane Dodd, International Institute of Gastronomy, *Culture, Arts and Tourism (IGCAT)*
Anna Spenceley and Issa Torres, *International Union for Conservation of Nature (IUCN) Tourism and Protected Areas Specialist Group (TAPAS Group)*
Benjamin Lephilibert and Oranuch Sirisucharittham, *LightBlue Environmental Consulting*
Claire Cutting and Amy Bourne, *Marriott*
Veronica Bunge, *Ministry of Agriculture, Mexico*
Nancy Fabiola Hernández, *Ministry of Tourism, Mexico*
Jean Guedon, *Ministry of Ecological Transition, France*
Clara Randulfe Sánchez, *Ministry of Industry, Trade and Tourism, Spain*
Adriana Relja and Antonela Frkovic, *Ministry of Tourism, Croatia*
Clara Randulfe, *Ministry of Industry, Trade and Tourism, Spain*
Linden Coppell, *MSC Cruises*
Christopher Warren, *My Green Butler*
Graham Harper and Napason Wetchapram, *Pacific Asia Travel Association (PATA)*
Sven Wiltink, *Radisson Hotel Group*
Andrew Trabosh and Linken D'Souza, *Royal Caribbean International*
Barbara Zmrzlikar, *Slovenia Tourism Board*
Mafalda Borea, *Sustainable First*
Claire Whitely, *Sustainable Hospitality Alliance*
Paloma Zapata, *Sustainable Travel International (STI)*
Marco Sandri, *The PLEDGE™ on Food Waste*
Jeremy Sampson, *Terry Brown and Ben Lynam, The Travel Foundation*
Peter Richards, *Tourlink*
Andreas Vermöhlen and Ian Corbett, *TUI Group*
Sara Dolnicar, *University of Queensland*
Toine Timmermans, *Wagenham University*
Rosi Amerena, *Walking Mexico*
David Jackson and Kevin Duffy, *Winnow*
Liz Goodwin and Edwina Hughes, *World Resources Institute (WRI)*
Christopher Imbsen and Kmar Makni, *World Travel & Tourism Council (WTTC)*
Virgínia Antonioli, Lynette Tshabangu, Felipe Barney Arango, Viki Barboka, Innocentia Modau and Pavitray Pillay, *WWF*

Executive summary

The objective of the Global Roadmap for Food Waste Reduction in the Tourism Sector is to accelerate the uptake of food waste reduction strategies by tourism stakeholders.

The Roadmap aims to raise awareness among tourism stakeholders of the opportunities deriving from a more sustainable and circular management of food, with special emphasis on reducing food waste as a cost-effective and environmentally responsible strategy.

The Roadmap sets out how the tourism sector can contribute to the achievement of target 12.3. of the Sustainable Development Goals (SDGs) which aims at halving global food waste by 2030. It provides an action framework to accelerate food waste reduction in tourism sharing practical insights and guidance for the sector, with a particular focus on supporting accommodation providers and cruise lines to scale up impacts.

All in all, the Roadmap aims to guide the tourism sector to make a contribution towards a more sustainable and regenerative global food system, reflecting the sector's role in the food value chain and its potential to shape production and consumption patterns.

Why are we calling for more action on food waste reduction?

Food is a key element of the tourism experience. Food is also a precious resource. The way that food is handled has significant economic, social and environmental impacts, for both for tourism destinations and businesses.

The global food system is a major driver of environmental degradation and natural resource use. Food loss and waste exacerbate some of the most urgent challenges of our time, including climate change and biodiversity loss. Food loss and waste are also interconnected with the challenge of food security. **Tackling food loss and waste is one of the concrete actions needed to transform agrifood systems for people, planet and prosperity.**[1]

Tourism is part of the middle stages of the food value chain (food service) and therefore has potential to shape both what farmers (and fisherfolk, herders, etc) produce and sell and what consumers buy and eat.[2]

While there is no official data on the number of meals served to tourists globally, it is estimated that more than 80 billion meals were served to international and domestic tourists in 2019. Research from a variety of organizations taking action to reduce food waste has resulted in findings which, despite their limitations, provide a useful overview of the current concerning situation with large amounts of food being wasted in tourism.

By addressing food waste, there are opportunities for tourism organizations to improve business efficiency and reduce operational costs; to reduce their environmental impacts, including the reduction of greenhouse gas (GHG) emissions by integrating food waste reduction as a climate action strategy; and to support food security by increasing their capacity to redistribute surplus food. Lastly, there is an opportunity to expand the focus of national tourism policies on food beyond a competitiveness approach linked to gastronomy and towards sustainable food management, placing strong emphasis on food waste reduction through prevention, redistribution and diversion from landfill or discharge to sea (circulation). Good practices in tourism can increase awareness about the importance of reducing food waste, and trigger more sustainable lifestyles.

Tourism businesses are involved in various stages of food management: procurement; inventory management, preparation and presentation of menus; consumption by the guests; and waste management, with food waste occurring at each of the stages and hence being a cross cutting issue. Food waste reduction is therefore a key element in advancing a transition towards more sustainable food management in tourism, including the integration of circular processes.

How can tourism stakeholders take action on food waste reduction?

The Roadmap wishes to align the efforts of the tourism sector with existing impactful initiatives such as the "Target – Measure – Act"[3] approach proposed by Champions 12.3.; the United Nations Environment Programme (UNEP) -led Food Waste Index for SDG 12.3.[4]; or the Voluntary Code of Conduct for Food Loss and Waste Reduction from Food and Agriculture Organization (FAO).[5]

The Roadmap encourages and provides recommendations for tourism stakeholders to:

Set Targets
Set the ambition by identifying a food waste reduction target;

Measure Progress
Measure in a consistent way to be able to track progress against a baseline;

Take Action
Take action to reduce food waste in tourism operations, work in partnership with suppliers and help guests reduce their food waste; and

Report
Disclose progress, showcase successes, share learnings and challenges with other stakeholders to trigger changes at scale.

Rooted on the principles of the food waste (and drink) **hierarchy, the Roadmap sets out an action framework to prevent, redistribute and divert (circulate) food waste.** The prevention of food waste is the primary strategy to avoid food surplus and waste being generated in the first place. In a second instance food surplus needs to be redistributed to feed people, followed

by animal feed or reuse in biomaterial processing. Thirdly, where food waste can no longer be prevented, it should be diverted from landfill or discharge to sea by applying circular and value-added processes, such as recycling or energy recovery; so as to avoid disposal.

The tourism sector can play a critical role in achieving SDG12.3 by adopting a unified approach towards tackling food waste. While the initial action framework proposed in the Roadmap is focusing on accommodation providers and cruise lines, its recommendations are applicable to all tourism stakeholders and should be adopted where possible.

To accelerate the reduction of food waste in tourism operations through prevention, redistribution and diversion from landfill or discharge to sea (circulation), the Roadmap proposes the following targets:

Accommodation providers:

- By 2030, halve food waste per guest night; and
- By 2030, divert 100% of residual food waste from landfill (or incineration) or 50% where the infrastructure does not exist.

Cruise lines:

- By 2030, halve food waste per guest day; and
- By 2030, increase capacity on-board (or in port) to process 100% of residual food waste, avoiding any need to discharge to sea by 2030.

The Roadmap shares recommendations on measurement and introduces some methodologies and tools, as well as additional intensity metrics (e.g., food waste per customer/cover) and comparable metrics. The Roadmap invites organizations to develop an Action Plan, or to update an existing one, and implement it. An extensive check list of key action areas to address within business operations (including at company level, at hotel/ship level or for staff engagement) and for guest engagement is provided to support the development of the Action Plans. Lastly, the Roadmap encourages recommends organizations to report annually and publicly on progress against their food waste reduction targets.

To meet the targets proposed by the Roadmap on food waste reduction (through prevention, redistribution and diversion -circulation-) at sector level, collaborative and concerted efforts are required. In addition to accommodation providers and cruise lines, every organization in the tourism sector can play its part by taking action to reduce food waste in tourism operations and by helping suppliers and guests to do the same. Associations for instance, can encourage their members to take action and tourism authorities and destination management organizations can support creating the enabling conditions and promoting precompetitive collaboration.

Call to action

There is a real need for the tourism sector to act now to build a resilient and sustainable future for itself and the planet.

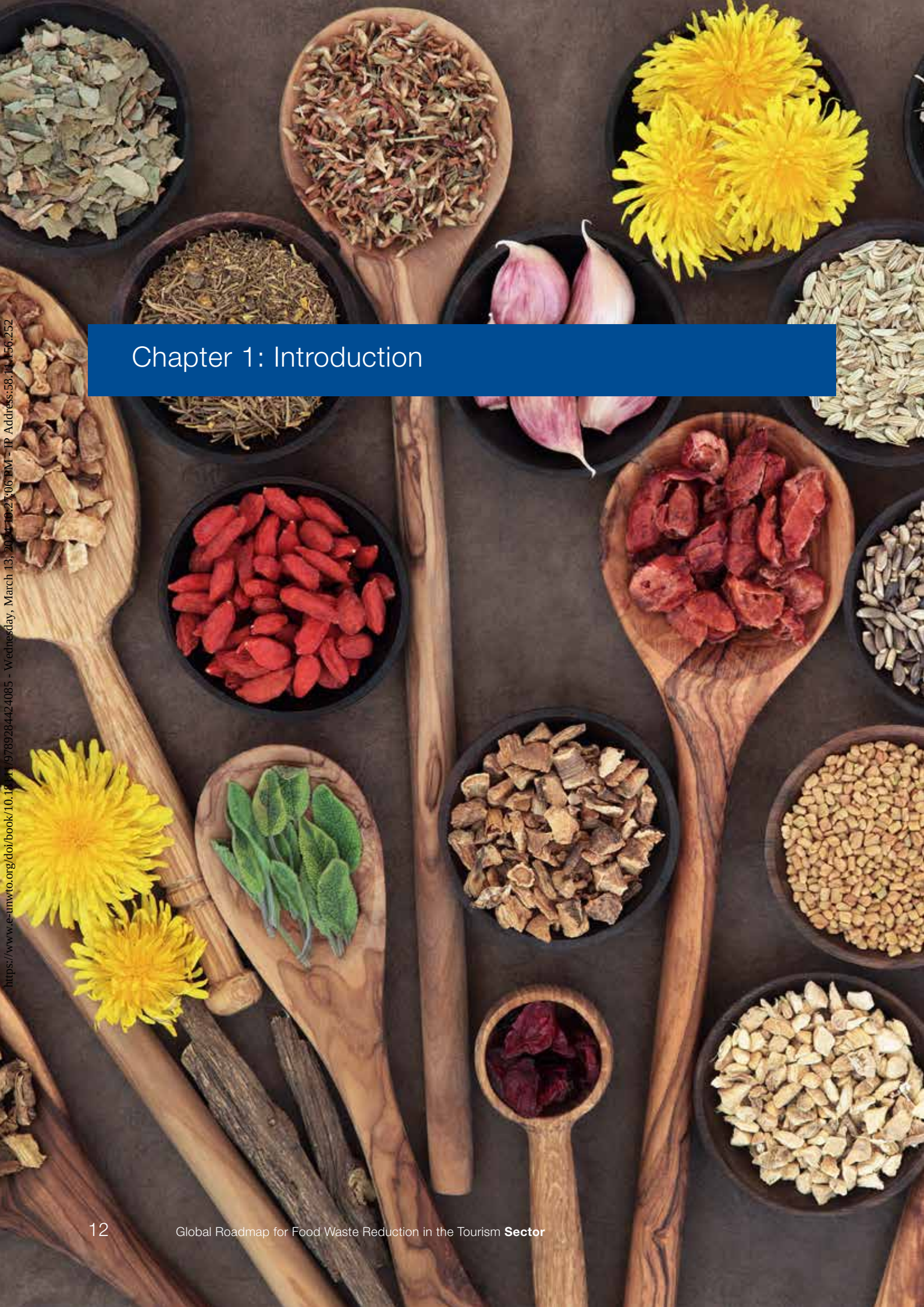
There is a clear business case for, and multiple benefits to be realised from, reducing food waste within an organization. Addressing food waste should be seen as a management tool to facilitate continuous improvement of business efficiency, helping to identify hotspots against which action can be taken to reduce operational costs, lowering the impact of wasted food on the environment and demonstrating to guests the commitment of the organisation towards reducing GHG emissions and supporting food security.

All tourism stakeholders are strongly encouraged to implement the recommendations of the Global Roadmap for Food Waste Reduction in Tourism.

Methodology and limitations

The Global Roadmap for Food Waste Reduction in Tourism has been developed within the framework of the One Planet Sustainable Tourism Programme[6] by the World Tourism Organization (UNWTO). It is part of the deliverables of the Joint Programme on "Promoting sustainable food consumption and production patterns through integrated tools, advocacy and multi-stakeholder action" which was funded by Multi-Partner Trust Fund for Sustainable Development Goal (SDG) 12. It builds on the UNWTO Recommendations for the Transition to a Green Travel and Tourism Economy[7] and supports the implementation of the Glasgow Declaration on Climate Action in Tourism.[8] The Roadmap was developed following a participatory approach that involved research and a series of consultations with the One Planet Sustainable Tourism Programme's Advisory Group on Food Waste which were supported by the United Nations Environment Programme (UNEP) and the French Ministry of Ecological Transition. The Waste and Resources Action Programme (WRAP) and the World Wildlife Fund for Nature (WWF) provided technical advice.

The Roadmap represents a significant collaborative effort. Nevertheless, there are areas which could be further enhanced to support stakeholders tackling food waste. Providing guidance for tourism destinations to take action on food waste or on the definition of baselines and use of complementary metrics are examples of some of the limitations faced. It is expected that through continuous collaboration and refinement, the action framework presented in the Roadmap will evolve to address its limitations and further support stakeholders in their food waste reduction efforts. UNWTO, through the One Planet Sustainable Tourism Programme, remains committed to support tourism stakeholders in the reduction of food waste through prevention, redistribution and the application of circular processes to divert food waste from landfill (or incineration) and discharge to sea.



Chapter 1: Introduction

Food is a key element of the tourism experience. Gastronomy is an asset for tourism destinations to diversify their offer, attract visitors to discover culinary traditions and recipes, and stimulate local, regional and national economic development.[9] Nevertheless, the implications of food consumption go beyond enhancing the competitiveness of tourism destinations and businesses.

Food is also a precious resource. The way that food is handled has significant social and environmental consequences, for both for tourism destinations and businesses. Sustainable food management can lead to positive outcomes, such as the creation of local jobs through the development of supply chain linkages with local producers, among other benefits. On the contrary, a poorly functioning local food network can lead to large amounts of food being imported and generate of food loss and waste, which in turn can increase greenhouse gas (GHG) emissions. Moreover, if not well managed, local food production for the tourism sector can have impacts on key resources like water or contribute to pollution.

The objective of the Global Roadmap for Food Waste Reduction in the Tourism Sector is to accelerate the uptake of food waste reduction strategies by tourism stakeholders.

The Roadmap aims to raise awareness among tourism stakeholders of the opportunities deriving from a more sustainable and circular management of food, with special emphasis on reducing food waste as a cost-effective and environmentally responsible strategy.

The Roadmap sets out how the tourism sector can contribute to achieving SDG target 12.3. which aims at halving global food waste by 2030. It provides an action framework to accelerate food waste reduction in tourism sharing practical insights and guidance for the sector, with a particular focus on supporting accommodation providers and cruise lines to scale up impacts.

The Roadmap builds on the UNWTO Recommendations for the Transition to a Green Travel and Tourism Economy.[10] It also supports the transition towards sustainable gastronomy, building on the Guidelines for the Development of Gastronomy Tourism[11] released by UNWTO and the Basque Culinary Center., by providing a consistent framework so that food never becomes waste. In addition, it supports the implementation of the Glasgow Declaration on Climate Action in Tourism by stressing the importance of reducing GHG emissions associated with food waste.

The Roadmap promotes the "Target – Measure – Act"[12] approach proposed by the high-level food loss and waste coalition Champions 12.3. and its call to action to scale up action on food waste reduction.[13] Lastly, it also promotes measuring and reporting of progress in support of the UNEP-led Food Waste Index for SDG 12.3.[14] and is aligned with the Voluntary Code of Conduct for Food Loss and Waste Reduction from FAO.[15]

Food has an important role to play in the transformation towards more sustainable tourism operations. Key measures include the integration of sustainable procurement criteria, the preparation of sustainable menus, engagement of consumers to encourage more sustainable behaviours, and reducing and better managing food waste. The Roadmap is anchored on food waste reduction as a way of introducing more circular practices into tourism operations, making sure that the value of food is retained as much as possible by avoiding disposal and reducing environmental impacts. Moreover, as waste is generated at all stages of the tourism food value chain, taking action to address it has potential to accelerate the pace of change at all levels of food operations.

All in all, the Roadmap aims to provide guidance for the tourism sector to contribute to a more sustainable and regenerative global food system, reflecting the sector's role in the food value chain and its potential to shape production and consumption patterns.

Chapter 2: Why are we calling for more action on food waste reduction?

According to FAO, significant levels of food loss and waste occur in multiple value chain stages between agrifood production to food consumption. Food loss and waste exacerbate some of the most urgent challenges of our time, including climate change and biodiversity loss. At the same time hundreds of millions of people on the planet are undernourished and billions cannot afford a healthy diet.[16]

Global stressors such as the COVID-19 pandemic and the war in Ukraine have also placed a spotlight on the interconnected issues of food security and food loss and waste. **Tackling food loss and waste is therefore one of the concrete actions needed to transform agrifood systems for people, planet and prosperity.**[17]

Organizations are having to rethink their operating models to meet these challenges. **For tourism organizations, integrating food waste reduction in their operations also represents an opportunity to reduce costs, improve efficiency, reduce the environmental footprint and curb GHG emissions,**[18] while supporting the transformation of the global food system and the implementation of the Agenda 2030 for Sustainable Development.

Food waste and the SDGs

In 2015, in response to the need for urgent action to address food loss and waste, countries of the world formally adopted a global food waste reduction target. SDG 12 seeks to "ensure sustainable consumption and production patterns". The third target under this goal, SDG 12.3., reads:

Addressing food loss and waste can contribute to addressing several other SDGs, in addition to SDG12 on sustainable consumption and production. These include SDG2 (zero hunger); SDG6 (sustainable water management); SDG8 (decent work and economic growth); SDG11 (sustainable cities and communities); SDG13 (climate change); SDG14 (marine resources) and SDG15 (terrestrial ecosystems, forestry, biodiversity).[20]

The progress achieved by countries implementing SDG 12.3. is measured by the Food Loss Index and the Food Waste Index.[21]

Reducing food loss and waste is one of the most effective ways to reduce the environmental impact of our global food system and increase food availability both for the food insecure and a growing population, without expanding agricultural production.[22]

2.1 The tourism sector can drive changes in the way food is consumed and produced

2.1.1 Sustainability challenges facing the global food system

The "food system" involves all activities that are related to the production, processing transportation and consumption of food. By definition, a "sustainable food system" should deliver food security and nutrition for all while being also profitable, benefiting society and having a positive or neutral net impact on the natural environment.[23] However, while the global food system generates jobs, supports food and nutrition security and often promotes rural and community development, it is also currently facing significant sustainability challenges.

The global food system is a major driver of environmental degradation and natural resource depletion. Conversion of land for agricultural production is the leading cause of global deforestation, forest degradation and conversion of natural habitats, resulting in biodiversity loss and GHG emissions.[24] [25] Extraction of minerals and abstraction of water for agriculture is leading to their depletion. Meanwhile, overfishing is causing loss of marine biodiversity and habitats whilst commercial aquaculture can result in widespread environmental pollution.[26] [27]

More specifically:

- GHG emissions attributable to the global food system are estimated to represent 34% of global emissions.[28]
- Half of the world's habitable land[29] and 70% of its available fresh water[30] are used by food systems.
- The global food system is the biggest contributor to biodiversity loss worldwide; agriculture is an identified threat to 24,000 of the 28,000 species at risk of extinction (86%).[31]
- It is estimated that one third of food produced globally for human consumption gets lost or wasted along the value chain.[32]
- Around 14% of the world's food is lost after being harvested and before reaching the market,[33] while a further 17% of food ends up being wasted in retail and by consumers (particularly households).[34]
- GHG emissions attributable to food loss and waste represent 8 – 10 % of global emissions.[35]
- Food loss and waste result in economic losses of nearly USD 1 trillion worldwide per year.[36]
- By 2030, food loss and waste are expected to increase by 60% (to 2.1 billion tons), resulting in a loss of over USD1.5 trillion.[37]

Beyond facing environmental challenges, the global food system also faces social and economic issues such as food security and nutrition. For instance, small-scale producers and agri-businesses have difficulties accessing viable markets. In addition, highly processed, low nutritional value food items are widely available.[38] Moreover, it is estimated that in 2021, between 8.9% and 10.5% of the world population still faced hunger[39] while around 12.7% individuals (adults and kids) were affected by overweight or obesity issues.[40]

There have been monumental shifts in the global food system over the past few decades. Food value chains – which comprise the supply chain actors and activities involved in the production, processing, distribution and consumption of food, as well as the institutional and regulatory environments within which supply chains exist – have become increasingly globalised and complex, facilitated by developments such as refrigerated transportation, improved information and communication and reduced trade barriers.[41] Consequently, the physical and social distance between value chain actors has increased, causing a disconnect between mid-chain food actors and the social and environmental impacts of their operations.[42] [43]

2.1.2 Tourism as a key player in the global food value chain

In 2021, UNEP issued a report on the value-chain approach and its application to food, construction and textiles.[44] The report builds on the International Resource Panel's Food Systems and Natural Resources Study and is complemented with research from UNEP, FAO, the World Resources Institute (WRI) and the University of Oxford. A "value chain approach" is a methodology that aims to connect science on natural resources and action on sustainable consumption and production. This is achieved by holistically considering the actors, processes, and socioeconomic context at every stage of a value chain in order to map 'hotspots' of high resource use and environmental impact. This mapping exercise then helps to identify key points of intervention in economic systems to implement more sustainable consumption and production patterns.[45]

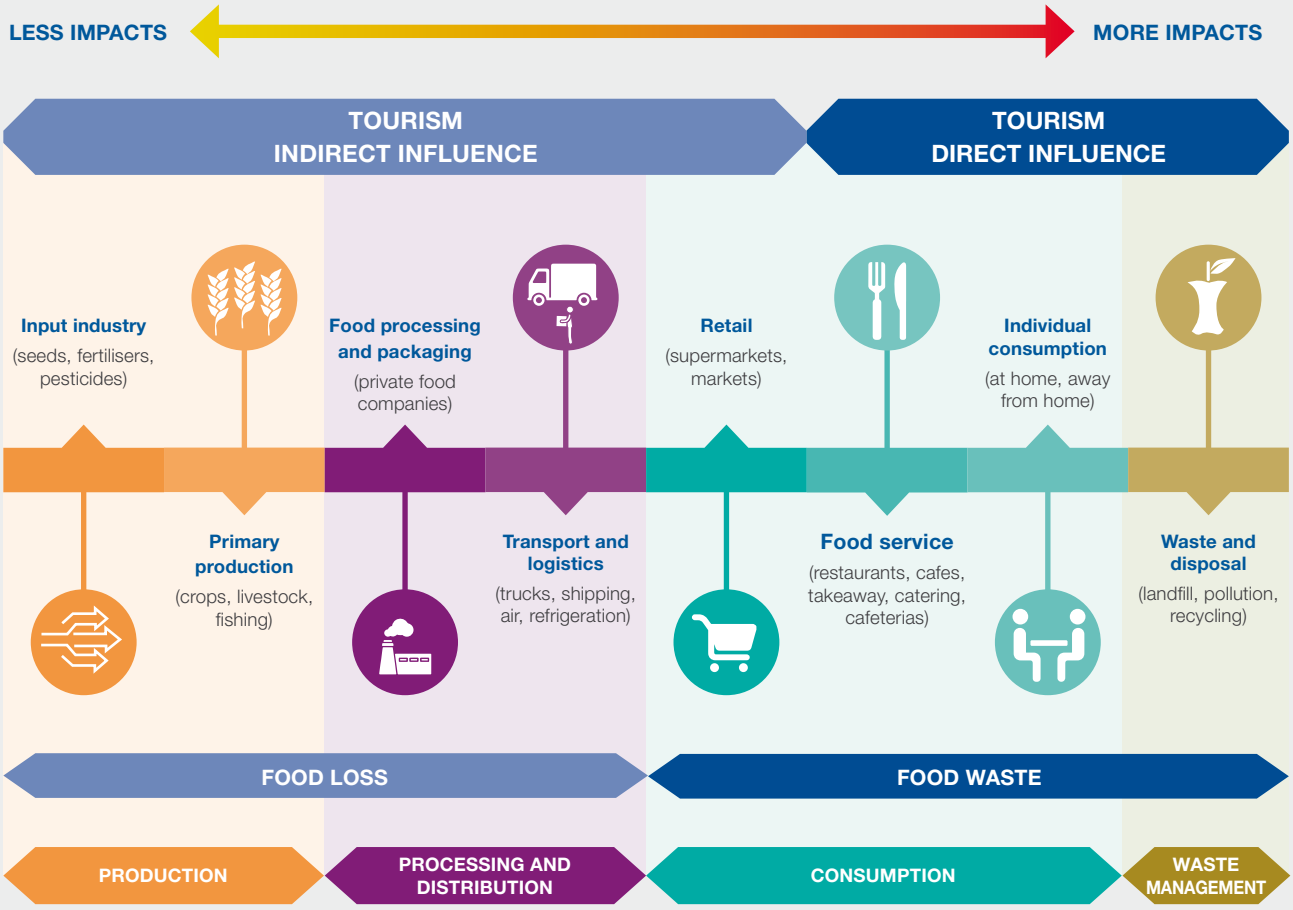
The application of the value chain approach to food systems carried out by UNEP in 2021 concluded that while natural resource use and environmental impacts occur mainly at the primary production stage, producers have a limited ability to shape food systems and change their production practices. Paradoxically, **it is the fewer actors operating at other stages of the food value– comprising food companies, retail and food services – who are structurally powerful and to a large degree shape both what farmers** (and fisherfolk, herders, etc.) **produce and sell and what consumers buy and eat.[46]**

Food loss and waste

Food "loss and waste" is the decrease in quantity or quality of food along the food value chain.[47]

Food "loss" occurs before the food reaches the consumer as a result from decisions and actions by actors involved in production, storage, processing and distribution. **Food "waste"** refers to food that is fit for consumption but is discarded as a result from decisions and actions by actors involved in the retail or consumption phases (including food service – and tourism – and household consumption).[48] Therefore, **reducing food waste that results from tourism-related operations and activities is within the direct control of tourism organizations,** whereas the influence of tourism on food loss reduction is more indirect and difficult to track.

Figure 1 **Tourism in the food value chain**



Sources: Adapted from **United Nations Environment Programme** (2021), *Catalysing Science-based Policy action on Sustainable Consumption and Production – The value-chain approach & its application to food, construction and textiles,* pp. 50, UNEP, Nairobi, online available at: https://www.oneplanetnetwork.org/sites/default/files/from-crm/report_unea5_catalysing_science-based_policy_action_on_scp_-_task_group_irp-one_planet_0.pdf

The more a food item advances through the value chain, the higher is its cost in both economic and environmental terms. With tourism-related food management being part of the "food service" stage of the food value chain, the sector can play an important role in driving changes towards a more sustainable management of food, given the accumulated impact of food products at that stage of the value chain.

For instance:

- Through the sustainable procurement of food, tourism businesses can create linkages with local producers (e.g., including those involved in agroecology[49]), reduce demand for resource-intensive food products, and generate local economic development opportunities for communities in tourism destinations, including for women and youth;

- By promoting sustainable menus and preparation practices, tourism businesses can contribute to the preservation of traditional cooking methods and recipes, promote healthier diets and utilize local ingredients and crops;

- By engaging with tourists on the importance of food and promoting sustainable food consumption, tourism businesses can trigger behavioural changes towards more sustainable lifestyles, showing that this does not decrease well-being; and

- Through better management of food waste, tourism businesses can reduce environmental impacts and reduce costs through the optimization of food operations and the integration of circular processes.

2.2 Addressing food waste can catalyze more sustainable and circular food management in tourism

2.2.1 Existing data suggests that food waste in tourism is a significant issue

In 2019, international tourist arrivals (overnight visitors) reached 1.5 billion[50] and there were more than 8 billion domestic tourist arrivals.[51] After a stronger than expected recovery from COVID-19 in 2022, the forecast released by UNWTO in January 2023 shows how international tourism is set to return to pre-pandemic levels in some regions in 2023 (with global international tourist arrivals reaching between 80-95% of pre-pandemic levels).[52]

While there is no official data on the number of meals served to tourists globally, estimations based on available data point to more than 80 billion meals served to international and domestic tourists in 2019. This amount of meals would correspond approximately with the meals consumed by a population of around 74 million people who eat three times a day, over a year period.

Unfortunately, there is no official data on food waste generated by global tourism and no reference values of food waste generated by different types of tourism business.[53] Nevertheless, given the significant amounts of food being consumed by the tourism sector, it is paramount to take ambitious and impactful action to support SDG 12.3 target on halving food waste globally by 2030. The growing trend in gastronomy tourism provides opportunities to scale-up the sustainable management of food in tourism.

Research from a variety of organizations taking action to reduce food waste has resulted in the following findings which, despite their limitations, provide a useful overview of the current situation:

- Food service, of which tourism forms a significant part in many countries, contributes 26% of all food wasted in the consumption part of the value chain at 32 kg per person per year;[54]
- In the US, about 63 million tons of food are wasted each year, with 40% coming from consumer-facing businesses, including restaurants and hotels;[55]
- In Europe, the hospitality and food service industries generate 12% of the total food loss and waste, at a value of more than EUR 35 billion;[56]
- Calculations from the UK estimate that about 18% of annual total food waste originates from the hospitality and food service industries, with 1 in 6 meals being wasted.[57] Food waste accounts for 30% to 50% of the overall waste generated by the UK hospitality and food service industries;[58]
- An analysis of more than 450 kitchens, for instance in hotels or cruise ships, shows that around 70% of waste (by value) occurs before the food reaches the customer, with around 30% of food waste coming from the plate itself;[59]
- The cost of food being wasted on an annual basis in the hospitality and food service industries has been estimated to be over USD 100 billion globally;[60] and
- A review of sustainability reports from the 50 largest hotel groups shows that 26 report on waste, with a wide variation in the reporting quality and food waste being high on their agendas for reporting.[61]

2.2.2 The economic, environmental and social reasons for addressing food waste in the tourism sector

Research from a variety of organizations taking action to reduce food waste has resulted in the below findings which provide evidence of the positive outcomes connected to food waste reduction.

Economic

There is an opportunity for tourism organizations to improve business efficiency and reduce operational costs by addressing food waste.

- A Champions 12.3. study of 42 hotels in 15 countries discovered that USD 7 were saved for every USD 1 invested in lowering kitchen food waste.[62] The report also found that on average hotels achieved a 21% reduction of kitchen food waste in just one year by weight;[63]
- For the hotels participating in the measurement element of Futouris' Sustainable Food Initiative, food waste was reduced, on average, by 28% in one year.[64] [65] The hotels reported savings of up to EUR 26,000 per season due to reduced food purchasing and waste disposal costs.[66] Cruise ships participating reduced food waste by over 17% in one year;[67]
- Sodexo, a global food services company, renewed its EUR 1.3 billion revolving credit facility in 2019 which incorporates a pricing adjustment based on their performance towards Sodexo's goal to prevent 50% of the food waste and food losses from its operations by 2025. Sodexo's Chief Executive Officer, reiterated the company's intention to be transparent and to be held financially accountable for its action on food waste;[68] and
- Moreover, as sustainability-linked finance is growing, taking action on food waste is aligned with Environmental Social and Governance (ESG) criteria and therefore has potential to support leveraging green finance.[69]

Environmental

There is an opportunity for tourism organizations to reduce their environmental impacts by addressing food waste as a climate action strategy to reduce value chain GHG emissions (i.e. scope 3 emissions).

- A report by WRAP[70] carried out an analysis of the total GHG emissions linked to the production and consumption of food and drink consumed in the UK between 2015 and 2019. For the hospitality and food service industries, the combined embodied emissions for the production and subsequent disposal per tonne of food waste was 3.39 tCO_2e (tonnes of carbon dioxide equivalent). From this it can be estimated that where preventing a tonne of food from becoming waste eliminates the need for producing a new tonne of food, this leads to a carbon saving of approximately 3.4 tCO_2e;
- Where it is not possible to prevent food from becoming waste, diverting it from landfill also delivers a carbon saving, notably reducing methane emissions from landfilling. A further report[71] from WRAP which developed a methodology for assessing the GHG impacts of waste management in the UK calculates that the potential carbon saving of diversion from landfill to composting (one tonne) to be in the region of 0.6 tCO_2e. This has also implications

on air quality as methane is not only a powerful short-lived climate forcer, but also a precursor of ozone, and therefore an air pollutant. Waste management is, together with energy and agriculture, one of the main sectors emitting methane;[72] and

– Organic waste that cannot be prevented can be valorised through anaerobic digestion, producing biogas and digestate that can be used as fertiliser. This contributes to reduce methane emissions, replace fertilisers of fossil origin and becomes a source of renewable energy.[73]

Different types of emission sources

According to the GHG Protocol,[74] there are three types of **emission sources:**

– **Scope 1 emissions:** emissions that an organization causes directly through combustion of fuels or use of refrigerants in its owned properties and vehicles.

– **Scope 2 emissions:** emissions an organization makes indirectly through the purchase of electricity or energy, for example, for heating and cooling buildings.

– **Scope 3 emissions:** emissions the organization is indirectly responsible for, up and down its value chain. Scope 3 is further subdivided into 15 types of emissions which include products bought from suppliers, business travel, employee commuting, outsourced services, waste, **food and beverage,** etc.

Social

There is an opportunity for tourism organizations to increase food security by increasing their capacity to redistribute surplus food (in alignment with local regulations).

– IHG's (InterContinental Hotels Group), True Hospitality for Good programme supported global partnerships in more than 70 countries to support food banks and other food provision charities in assisting those most in need during the COVID-19 crisis.[75]

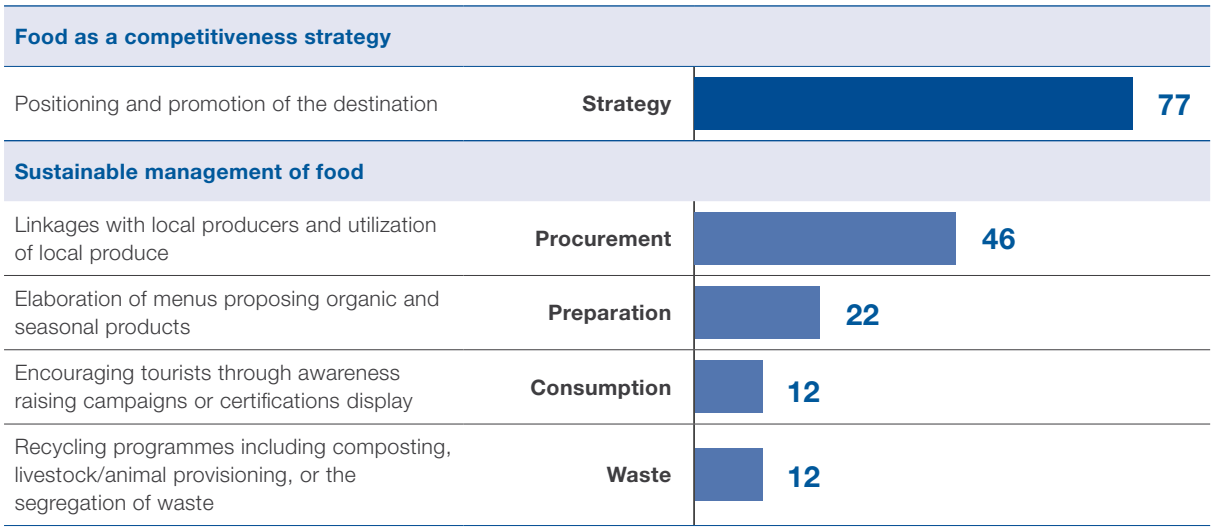
– In 2021, PONANT Cruises[76] donated more than two tonnes of surplus food from three ships docked in Marseille to the local food bank, Banque Alimentaire, which feeds nearly 100,000 people per year. These efforts were made possible through the collaboration between the Marseille Provence Cruise Club, the Port of Marseilles Fos, and the customs authorities.

– By implementing and promoting food waste reduction strategies, the tourism sector can inspire travellers to adopt more environmentally conscious habits, ultimately fostering a ripple effect of sustainable lifestyles beyond the realm of tourism. In this way, the industry's commitment to responsible practices can have far-reaching and lasting consequences in the global fight against food waste.

2.2.3 National tourism policies provide a starting basis for integrating food waste reduction

A UNWTO review of national tourism policies from 114 destinations conducted between July and December 2022 concluded that **in the majority of these policies (77%) food is discussed as a strategy related to the competitiveness of destinations, with potential to attract visitors and benefit the local economy.**[77] In contrast, policies seldom include references to the sustainable management of food across the different stages of the tourism food value chain, namely procurement, preparation of menus, consumption and waste.

Figure 2 **Types of references to food in national tourism policies (n=114) (%)**



Sources: World Tourism Organization (UNWTO) research on national tourism policies on food (2022).

Only 14 of the policies reviewed include references to food waste management. While there could be ongoing action on food waste reduction which is not captured by the policies, the findings suggest **there is an opportunity to expand the focus of national tourism policies on food beyond a competitiveness approach linked to gastronomy and towards sustainable food management, including a strong focus on food waste reduction.**

Food waste and the Paris Agreement

Countries' national climate plans under the Paris Agreement – also known as Nationally Determined Contributions (NDCs), provide key entry points for integrating food waste measures to help reduce GHG emissions and support adaptation.[78]

At present, **only 18% of countries have included measures related to food waste reduction in their NDCs** and 34% of countries mention plans to improve food waste disposal and treatment, such as increased composting and diverting organic waste from landfill.[79] Therefore, there is ample opportunity for countries to strengthen their mitigation targets and enhance their NDCs by tackling food waste.[80]

The tourism sector, which is currently mentioned in 53% of NDCs,[81] is well positioned to support these efforts and in turn, also embrace food waste reduction as an environment and climate action strategy in national tourism policies.

2.2.4 Tackling food waste is key to advancing circularity in tourism operations

Tourism businesses are involved in various stages of food management: procurement; inventory management, preparation and presentation of menus; consumption by the guests; and waste management, with food waste occurring at each of the stages and hence being a cross cutting issue.[82] For instance, **food waste can be generated during the preparation of menus** due to overproduction, cooking error and the excessive use of ingredients, as well as due to spoilage of products due to poor inventory management resulting in exceeding expiration dates, among others. Guests can also lead to **plate waste** by misjudging the portions or simply due to indulgent behaviours. Moreover, food waste can also be generated at the level of **procurement** by sourcing foods from suppliers with little commitment to reduce food waste or by the incorrect storage of the food received. Therefore, by addressing food waste, changes at all stages of food management can be triggered.

Circularity as a strategic approach in tourism

Circularity represents a strategic approach for the tourism sector given the potential of a circular economy to decouple economic growth from resource use.[83] Integrating circular economy processes – Refuse, Reuse, Reduce, Redesign, Repurpose, Remanufacture, Repair, Refurbish, Recycle[84] – in tourism operations can facilitate a transition from linear to circular business models and help to reduce GHG emissions and pollution, improve resource efficiency and address issues linked to natural resource extraction and exploitation.[85]

The most commonly used classification of circular business models includes five types: circular supplies; resource recovery; product life extension; sharing platforms; and product as a service.[86] **Business models that aim to use food waste as a resource are connected to "resource recovery" and present opportunities for food waste to be used as a secondary raw material. "Sharing platforms" also provide opportunities to redistribute food surplus.**

The definition of "food waste"

For the purposes of the Food Waste Index, which is used to measure progress in the achievement of SDG 12.3., "food waste" is defined as food (see below) and the associated inedible parts removed from the human food supply chain in the following sectors: Retail, Food service, Households.[87]

"Removed from the human food supply chain" means that it has either been sent for recycling (e.g., anaerobic digestion; compost; land application; incineration with energy recovery) or disposed (e.g., landfill; sewer).

"Food" is defined as any substance – whether processed, semi-processed or raw – that is intended for human consumption. Food includes drink, and any substance that has been used in the manufacture, preparation or treatment of food. Therefore, food waste includes both:

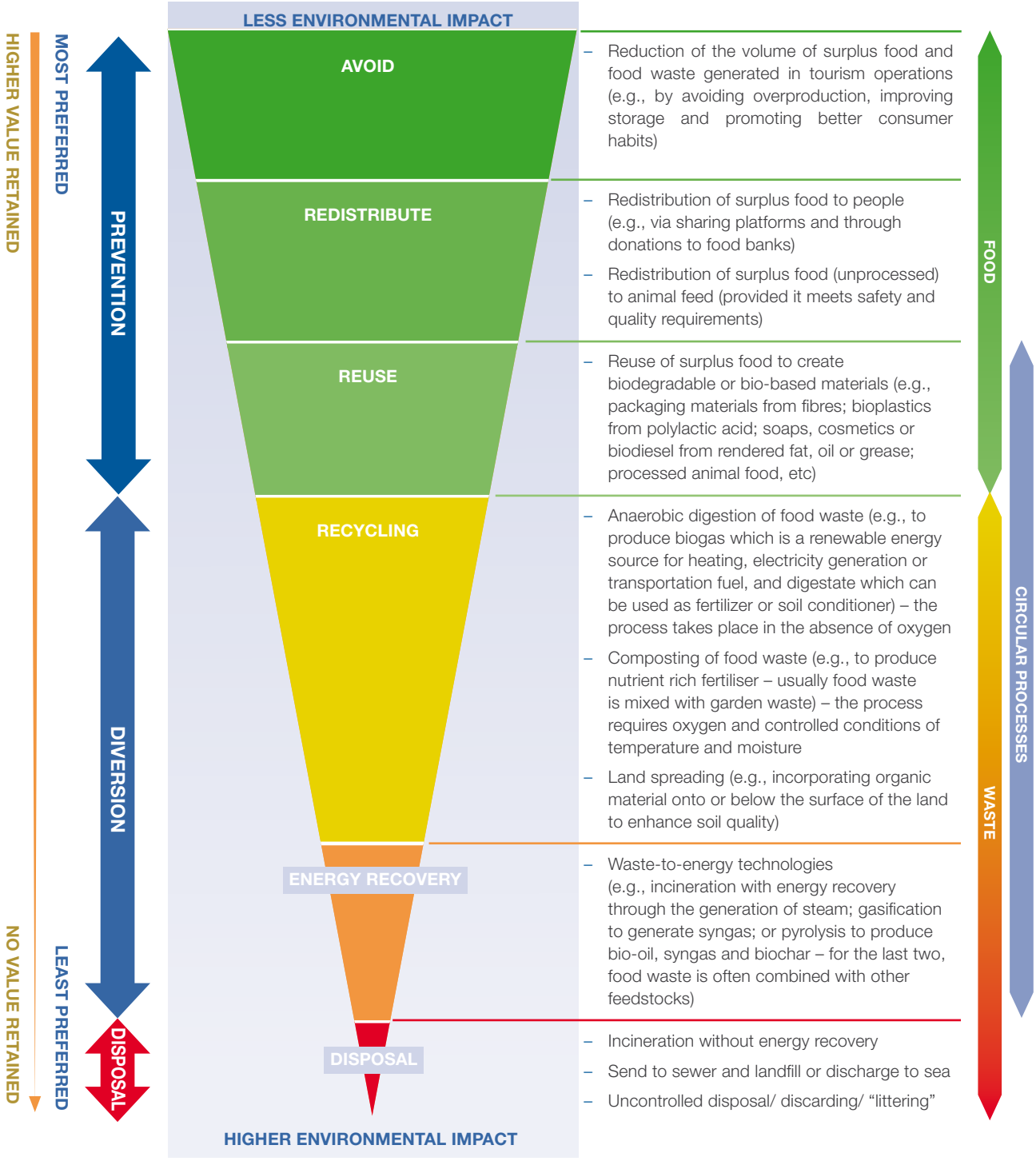
- **Edible parts**: i.e., the parts of food that were intended for human consumption; and
- **Inedible parts**: components associated with a food that are not intended to be consumed by humans. Examples of inedible parts associated with food could include bones, rinds and pits/stones.

The food (and drink) waste hierarchy has been developed to help organizations prioritise the management of food surplus and waste in their operations. It sets out steps for managing food waste in an environmentally sound manner which maximises its secondary uses, retaining economic value (valorization), and minimizes the amount of food waste going to landfill or discharged at sea.

The hierarchy allocates the highest priority to the prevention of food surplus and waste. Secondly, food surplus that may arise needs to be redistributed for human consumption or animal feed. or reused in biomaterial processing. Thirdly, where food waste can no longer be prevented, it should be diverted from landfill or discharge to sea through circular (and value added) processes such as recycling or energy recovery; so as to avoid disposal.

Food waste management strategies should be applied in the order they are listed in the hierarchy, but it may not always be possible to do so. **The extent of possibilities available for tourism destinations and businesses to apply food waste management strategies towards zero waste to landfill may depend on cost, the facilities and infrastructure available and applicable regulations.** In general terms, the higher up the hierarchy, the more beneficial the strategy is to the organization and the environment.

Figure 3 **The hierarchy of food waste management strategies towards zero waste to landfill**



Sources: Adapted from:

Joint Research Centre (JRC) for the European Commission’s Knowledge Centre for Bioeconomy (2020), ‘Brief on food waste in the European Union’, published in 2020, Italy, European Union, online available at: https://food.ec.europa.eu/system/files/2021-04/fw_lib_stud-rep-pol_ec-know-cen_bioeconomy_2021.pdf

Australian Academy of Science (2020), *Transforming food waste: making something out of rubbish,* online available at: www.science.org.au/curious/earth-environment/transforming-food-waste-making-something-out-rubbish.

GOV.UK (n.d.), *Statutory guidance Food and drink waste hierarchy: deal with surplus and waste,* online available at: www.gov.uk/government/publications/food-and-drink-waste-hierarchy-deal-with-surplus-and-waste/food-and-drink-waste-hierarchy-deal-with-surplus-and-waste#contents.

United States Environmental Protection Agency (n.d.), Food Recovery Hierarchy, online available at: www.epa.gov/sustainable-management-food/food-recovery-hierarchy.

Chapter 3: How can tourism stakeholders take action on food waste reduction?

In 2016, Champions 12.3. – a coalition of executives from governments, businesses, international organizations, research institutions, farmer groups and civil society dedicated to inspiring ambition, mobilizing action and accelerating progress towards achieving SDG 12.3.- developed the "Target-Measure-Act" approach to support halving food loss and waste by 2030.[88]The approach is based on three simple steps wherein a country or company sets a food loss and waste reduction target, measures its food loss and waste and acts to reduce the hotspots of food loss and waste.[89]

Every year, the members of the Champions 12.3. coalition make a call for all governments and companies to follow the "Target – Measure – Act" approach.[90] This approach has demonstrated reductions in other sectors on a global platform as evidenced by 20 of the world's 50 largest food companies.[91]

The Roadmap wishes to align the efforts of the tourism sector with existing impactful initiatives and therefore encourages tourism stakeholders to:

Set Targets
Set the ambition by identifying a food waste reduction target;

Measure Progress
Measure in a consistent way to be able to track progress against a baseline;

Take Action
Take action to reduce food waste in tourism operations, work in partnership with suppliers and help guests reduce their food waste; and

Report
Disclose progress, showcase successes, share learnings and challenges with other stakeholders to trigger changes at scale.

FAO's Voluntary Code of Conduct for Food Loss and Waste Reduction

The Voluntary Code of Conduct for Food Loss and Waste Reduction[92] was released by FAO in 2022 and sets out a generic framework of actions and guiding principles that should be followed to reduce food loss and waste and support the transformation of agrifood systems to be more efficient, inclusive, resilient and sustainable. It is aimed both at governments and practitioners, including food service providers (i.e. tourism).

The overarching principle of the Code of Conduct is that actions to reduce food loss and waste should contribute to the economic, environmental and social dimensions of the SDGs, including food security. This overarching principle is supported by guiding principles including: human dignity; non-discrimination; equity and justice; gender equality and equity; consultation and participation; rule of law; transparency; accountability; cultural considerations; and ethical and responsible practices.

3.1 The action framework for food waste reduction in tourism operations:

a. Prevent.

b. Redistribute.

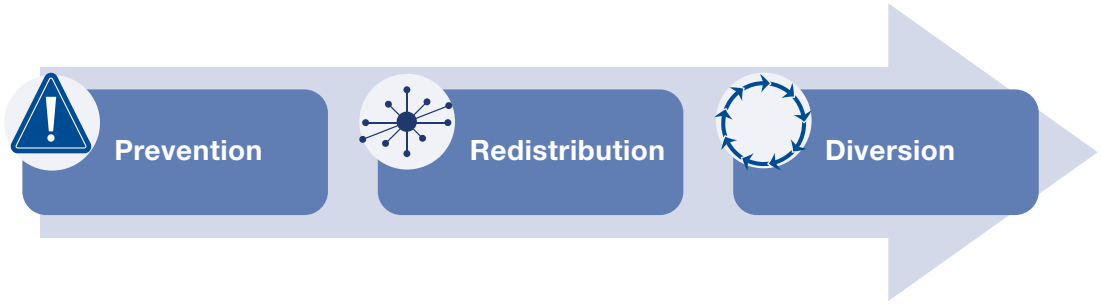
c. Divert (Circulate).

The tourism sector can play a critical role in achieving SDG 12.3 by adopting a unified approach towards tackling food waste.

Rooted in the principles of the food waste hierarchy, the Roadmap sets out an action framework with the **prevention of food waste is as the primary strategy** to avoid food surplus and waste being generated in the first place. In a **second instance food surplus needs to be redistributed to feed people, followed by animal feed or reuse in biomaterial processing. Thirdly, where food waste can no longer be prevented, it should be diverted from landfill or discharge to sea by applying circular and value added processes,** such as recycling, (i.e. composting, anaerobic digestion and land spreading) or energy recovery; so as to avoid disposal (i.e. to landfill, incineration -without energy recovery-, sewer or discharge to sea, or littering).

While the initial action framework proposed in the Roadmap is focusing on accommodation providers and cruise lines, its recommendations are applicable to all tourism stakeholders and should be adopted where possible.

It is recognised that the accommodation providers and cruise lines have made great strides to reduce food waste. There remains, however, both an opportunity and need to achieve more. In view of their share of the tourism market, both industries can implement changes that will have global impacts with respect to managing food waste.



Step 1: **Setting targets**

Prevention

To accelerate the reduction of food waste in tourism operations through prevention, the Roadmap proposes the following targets:

- **Accommodation providers:**
  By 2030, halve food waste per guest night; and

- **Cruise lines:**
  By 2030, halve food waste per guest day.

This is an overarching target, aligned with SDG 12.3, replacing per capita with guest nights and guest days[93] to make it more relevant to the industries under consideration. This target allows better benchmarking and monitoring of progress in real terms, mitigating for any significant changes in occupancy due to circumstances beyond the control of the business, e.g., the COVID-19 pandemic.

Food waste per guest night and food waste per customer/cover[94]

Food waste per guest night measures the total food waste generated during a guest's stay, considering all food and snacks consumed during that time. This metric helps businesses understand the overall food waste generated relative to their occupancy and can highlight areas for improvement in resource management and procurement processes.

On the other hand, food waste per customer/cover focuses specifically on individual food servings, offering insights into food waste patterns at the dish or menu level. The food waste per customer accounts for the number of customers served per day and not only for the customers that booked a night. Food waste per cover accounts for the number customers served per service. These metrics allow businesses to identify inefficiencies in portion sizes, menu planning, or food preparation processes, enabling them to make more targeted improvements to reduce waste during food service.

These metrics can be complementary and, when used in tandem, businesses can gain a more comprehensive understanding of their food waste generation and identify opportunities for improvement at multiple levels, from broad resource management to individual menu offerings.

Scope of prevention target

A prevention target should aim to reduce food surplus and waste, and prevention shall include redistribution to people, animal feed (where permitted by regulation) or reuse for biomaterial processing, as well as prevention at-source. **The target should cover food under a business' own operations, from receipt of food goods at the site/ship to disposal from the site/ship.**

Edible and inedible food parts

- **Edible parts** are the parts of food that were intended for human consumption; and
- **Inedible parts** are the components associated with a food that are not intended to be consumed by humans. Examples of inedible parts associated with food could include bones, shells, rinds pits/stones and coffee grounds.[95]

In accordance with the Food Waste Index[96] **the Roadmap encourages organizations to target (and measure and report on) food waste including its associated inedible parts.**

Regularly measuring edible and inedible parts separately can be challenging and incorporating inedible parts may make the results of reduction efforts less noticeable. To address this challenge, it is possible to establish a ratio of edible to inedible components by conducting an intervention over several days, during which both categories are quantified. This approach ensures that businesses opting to prepare fresh meals, which frequently generate a higher volume of inedible waste, are not unduly disadvantaged when presenting their waste reduction initiatives. Periodic adjustments to the established ratio can be made in response to significant menu alterations or conducted on an annual basis.

Targets other than 50%

Each business will want to assess which target will be achievable in their own operations, but aligning with the SDG 12.3 target to reduce 50% of food waste by 2030 is recommended as it is widely recognised and adopted in many regions. Where an organization is unable to commit to 50% reduction due to previous reductions achieved, the adopted target should be relevant, ambitious and justified.

Should this be a relative or an absolute target?

At a global level, SDG 12.3 aims to reduce food waste by 50% per capita, meaning that it is a relative target. When applied to an organization the prevention target should also be relative – e.g., an average 50% reduction in the amount of food waste per guest night or per day.

Example **Setting a relative target**

If an organization's baseline is 0.32 kg of food waste per guest day, their target would be to achieve 0.16 kg of food waste per guest day by 2030.

- Baseline in 2022 = Annually 1,600 kg food waste produced as a result of 5,000 guest days = 0.32 kg per guest day; and
- Target for 2030 = 50% = 0.16 kg per guest day.

This could be achieved by:

- 800 kg food waste; 5,000 guest days = 0.16 kg per guest day.

Or taking business growth into account:

- 1,120 kg food waste; 7,000 guest days = 0.16 kg per guest day.

Baseline year

The baseline year for the target should be set as the earliest year for which comparable historical data is available. The business should ensure that the data is robust and consistent. If comparable historical data are not available, the organization should begin measuring and develop a baseline as soon as possible (it is recommended to measure within 18 months from committing to reduce food waste). If the business is unsure as to whether the baseline is representative, it is advisable to re-visit and re-set the baseline as more accurate data become available or the scope of measurement is extended.

Case study **Soneva**

Soneva is a luxury resort operator. Located on remote islands there is a restricted choice of food products available locally and waste management infrastructure is severely limited. Faced with these challenges Soneva introduced a Waste-to-Wealth programme to reduce, transform and manage waste in each of their resorts. To date the programme has delivered a 50% reduction in food waste when compared to a 2019 baseline and through composting has achieved 100% diversion of food waste from landfill or discharge to sea. The Waste-to-Wealth programme has saved US$ 3 million since its introduction.

Find out more at: www.oneplanetnetwork.org/programmes/sustainable-tourism/food-waste-reduction/case-studies.

Case study **Lindblad Expeditions**

Environmental sustainability is at the heart of Lindblad Expeditions' operations, with the company achieving carbon neutrality in 2019. Part of this work is careful procurement and service of food, and management of food waste. Components of this programme include smart purchasing, local procurement, food storage strategies, planned cross-utilization, and involvement of guests.

Efforts have resulted in a 45% measured decrease in food waste by transferring to plated meals, and 10% less vegetable procurement due to cross-utilization and ingredient preservation strategies. In the future, Lindblad Expeditions will expand food sustainability programmes with efforts to engage crew, guests, stakeholders in ports of call, and the public.

Find out more at: www.oneplanetnetwork.org/programmes/sustainable-tourism/food-waste-reduction/case-studies.

Redistribution

Where food surplus arises e.g., from over production, the organization should consider options such as making the surplus available (where permitted by local regulations) to staff or redistributing it to other people via charity organizations and prevent it from becoming waste. Other options to redistribute the surplus for animal feed (where permitted by local law) or reuse in biomaterial processing.

As the primary focus should be on prevention and the prevention target covers food waste as well as surplus, it is not necessary to define a specific target for redistribution to people or animal feed. This is also applicable for food surplus being sent for reuse in biomaterial processing.

Diversion (Circulation)

Where prevention actions and surplus redistribution options have been exhausted and food waste remains, additional benefits to save costs and reduce GHG emissions can be achieved by segregating and circulating food waste so that it is diverted from landfill or discharge to sea.

The food waste hierarchy establishes the order of priority for food waste management strategies and organizations should focus their efforts on moving food waste up the hierarchy to more beneficial and circular processes, such as segregating food waste for anaerobic digestion and composting where such infrastructure exists. Operators of a certain size, like hotels, can even create these infrastructures for their own use, or establish partnerships with local authorities to develop them in a coordinated and potentially also precompetitive manner. The application waste-to-energy processes to food waste for energy recovery is also an option.

While some organizations may be able to precisely track amounts of food waste being recycled or sent to energy recovery and therefore could set specific targets for these matters (and subsequently measure and report), the Roadmap recommends that, as a minimum threshold, organizations set a target on diversion from landfill or discharge to sea which could comprise all food waste being diverted (circulated).

To accelerate the reduction of food waste in tourism operations through the application of circular processes and therefore diversion from landfill or discharge to sea, the Roadmap proposes the following diversion (circulation) targets:

- **Accommodation providers:** By 2030, divert 100% of residual food waste from landfill (or incineration) or 50% where the infrastructure does not exist; and
- **Cruise lines:** By 2030, increase capacity on-board (or in port) to process 100% of residual food waste, avoiding any need to discharge to sea by 2030.

Scope of diversion target

In accordance with the food waste hierarchy diversion from landfill (or incineration) or discharge to sea would include recycling (i.e., anaerobic digestion, composting and land spreading) and energy recovery.

Other types of disposal such as incineration (without energy recovery), sewer or littering are not explicitly mentioned in the target, but they are also included, as the scope of the target is to avoid disposal by diverting food waste through circular processes.

Targets other than 100%

Where an organization is unable to commit to 100% diversion from landfill (or incineration), or 50% for accommodation providers when infrastructure is not available, the adopted target should be relevant, ambitious and justified.

Where there is no infrastructure available to enable diversion from landfill (or incineration) or discharge to sea then the focus should again be on the prevention of food waste.

The prevention target and diversion target are complementary in that delivery against the prevention target will automatically deliver against the diversion target, but with significant economic, social and environmental benefits over diversion alone.

Should this be a relative or an absolute target?

The recommended target for diversion is relative to the total food waste generated per annum as it aims to capture the % of food waste which was diverted from landfill (or incineration) or discharge to sea.

Adoption of the diversion target by the cruise sector

Regulations applicable to food waste from cruise lines

Discharge of food waste at sea is regulated by MARPOL Annex V.[97] In-port disposal is subject to the country's regulations for International Catering Waste (ICW).

ICW is food waste from international transport vehicles including cruise ships (and airplanes). ICW is subject to strict regulations due to the potential risks associated with the spread of diseases, pests and invasive species. In many countries, ICW must be handled, stored and disposed in accordance with specific biosecurity regulations.

Food and drink are only considered ICW when it is no longer intended for human consumption or has been mixed with food waste. Once classified as such ICW requires specialist treatment for disposal, e.g., incineration.

Regulations around ICW management can vary significantly between locations and the possibility of processing food through anaerobic digestion at port would depend on the local regulations and the availability of permitted facilities. It is therefore essential to consult with the appropriate regulatory authorities in each country to determine the specific regulations and requirements (permits) for processing ICW at port.

Preventing food from becoming waste by donating surplus (when legislation in place allows this practice) is one method of reducing ICW.

Engagement with the cruise sector has identified a desire to address the challenges of discharge to sea and the limitations posed by ICW regulations.

Organizations in the cruise sector around the world are already piloting and scaling solutions to process food waste using ship based anaerobic digestion systems. The scaling of these systems, and similar land-based systems, has the potential to drastically reduce the negative environmental impacts associated with the oceanic discharge of waste while producing valuable outputs like energy and fertilizer. Nevertheless, the possibilities for land-based systems to be developed would depend on the application of ICW regulations at local level which is very restrictive as for instance, the digestate originating from food waste processed by anaerobic digestion on board would also be considered ICW, restricting the options for it to be used as fertilizer.

Piloting of this technology will inform cross-sector work to scale diversion strategies that deliver positive business and environmental outcomes. Additional options, for instance piloting the authorisation of permits for piloting energy recovery at port, should be explored.

For the above reasons, the Roadmap recommends for cruise lines to adopt the diversion target and to deliver it by increasing onboard capacity and in-port capacity (where permitted) to process 100% of food waste, avoiding the need to discharge it to sea.

Case study **Royal Caribbean Group**

For thirty years, Royal Caribbean Group (RCG) has been operating the Save the Waves program with the primary goal of preventing all waste from being thrown overboard. Save the Waves has evolved through the years to encompass robust policies, initiatives, and technologies. In 2021, RCG launched a new five-year WIN on Waste initiative to help reduce food waste on ships by 50% through careful food procurement, handling, preparation, service, and disposal.

Today, crew members on every RCG ship are responsible for recording, reviewing, and actualizing data to prevent food waste. In 2022, 100% of the Group's ships are equipped to be landfill-free, with an 87% reduction in waste-to-landfill measured between 2007 and 2021.

Find out more at: www.oneplanetnetwork.org/programmes/sustainable-tourism/food-waste-reduction/case-studies.

Case study **Carnival Corporations**

An example of how the cruise sector is addressing both the challenge of discharge to sea and ICW is Carnival Corporation's Operation Oceans Alive programme. It is a call to action for all employees to protect the oceans, seas and waterways from environmental harm. As part of the programme, Carnival Corporation have implemented a task force to improve food waste management across the fleet; committed to building ships without the need to discharge to the ocean or air (zero-emission ships); installed food waste bio-digesters to minimise the volume of food waste and committed to send 100% of waste to waste-to-energy facilities.

As a result of Carnival Corporation's programmes, since 2015 Costa Cruises has achieved a 27% reduction in food waste across its fleet of 12 ships, targeting continued improvement and focus on sustainable food and responsible consumption and donating, together with its Foundation over 1.1 million meals to people in need in 15 destinations.

Find out more at: www.oneplanetnetwork.org/programmes/sustainable-tourism/food-waste-reduction/case-studies.

Target setting

Some businesses will need to carry out initial data gathering prior to setting a target. A good first step is to undertake a food waste audit or assessment, internal and/or external, to better understand the scale and causes of food waste – and then set a target for the business accordingly. A **food waste assessment** will identify what is actually being thrown away, why this happens what are the possibilities to reduce food waste through prevention, redistribution and diversion from landfill (or incineration) and discharge to sea through the application of circular strategies.

STEPS OF A FOOD WASTE ASSESSMENT[98]

Establish objectives

Clearly define the goals and scope of the food waste assessment. Determine the specific areas or aspects of food waste you wish to focus on, such as preparation waste, plate waste, or spoilage.

Select appropriate metrics

Choose relevant food waste metrics that align with your objectives and industry context and complement the recommended overarching metric of food waste per guest night, such as food waste per cover.

Collect data

Set up a systematic process for measuring and recording food waste data over a specific period. This may involve manual tracking, digital tools, or a combination of both. Ensure that staff are trained on how to accurately measure and record food waste data.

Analyze data

Process the collected data to identify patterns, trends, and areas of concern. This may involve calculating the selected food waste metrics, comparing data across different time periods or locations, and identifying any anomalies or outliers.

Identify improvement opportunities

Based on the data analysis, pinpoint specific areas where food waste can be reduced or managed more effectively. This may involve adjusting portion sizes, improving food storage and handling practices, or modifying menu offerings.

Implement food waste reduction strategies

Develop and implement targeted strategies to address the identified improvement opportunities. Monitor the effectiveness of these strategies and make adjustments as needed to ensure continuous improvement.

Communicate results

Share the findings of the food waste assessment with relevant stakeholders, including staff, management, and customers. This may involve reporting on key metrics, discussing improvement strategies, and celebrating successes.

Regularly review and update

Periodically repeat the food waste assessment process to track progress, evaluate the effectiveness of implemented strategies, and identify new opportunities for improvement.

There are several resources available which provide guidance on how to carry out a food waste assessment. For instance:

- How to conduct a food waste audit; Winnow.
- How to conduct a food waste audit; LeanPath: Food Waste Audit Guide.

There may also be instances where a business needs to reset its baseline if significant changes to the business occur (e.g., structural changes such as mergers, acquisitions, and divestments).

Further guidance on setting a prevention target, together with guidance on scope and measurement is available from:

- Food Waste Protocol and Standard Related Tools; World Resources Institute (WRI): Tools & Resources - Food Loss and Waste Protocol ; and
- UK Food Waste Reduction Roadmap sector guidelines; WRAP: Hospitality and food service guidelines .

Adoption of year-on-year targets

Tracking progress against the 50% reduction target can be assisted by setting a Year-on-Year (YoY) target. For example, setting a reduction target of 8.5% YoY against a 2022 baseline would deliver an overall reduction of 51% by 2030.

Table 1 **An example of target process against a Year-on-Year reduction**

Indicator	**Baseline**								**Target year**
	2022	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Target YoY reduction (%)		8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
Target food waste reduction (%)	**0**	8.5	16.3	23.4	29.9	35.9	41.3	46.3	50.9
Corresponding food waste (kg) /guest day	**0.32**	0.29	0.27	0.25	0.22	0.21	0.19	0.17	0.16

This YoY target and performance against it should be reviewed annually, adjusted accordingly and any changes communicated.

Milestones

All milestones below consider food waste in metric weight (kg, tonnes, etc.) unless otherwise stated.

Food waste prevention

The following recommended milestones have been set to track progress against the prevention target. The organization should review progress against the following milestones:

Table 2 **Percentage trajectory for food waste prevention (%)**

Status		Reduction		
	2023	2025	2027	2030
Assuming new to subject	Establish baseline	20	35	50
Already measuring	State baseline year	25		50

Food waste diversion

The following recommended milestones have been set to track progress against the diversion target:

Table 3 **Percentage Trajectory for Food Waste Diversion (%)**

Indicator	Milestones			
	2023	2025	2027	2030
Where infrastructure exists - percentage of food waste sent to landfill (or incineration) or discharged to sea	25	10	5	0
Accommodation Where no infrastructure exists - percentage of food waste sent to landfill (or incineration)	90	80	70	50
Cruise Where no infrastructure exists - percentage of food waste discharged to sea	75	50	25	0

Step 2: **Measuring progress**

Many organizations are unaware of the scale of the waste they generate and its impact – financially, socially and environmentally. What is measured, is better managed, and this is particularly relevant to food waste.

The Roadmap recommends organizations to measure food waste across their own operations in a consistent way to enable year on year comparison of progress against their food waste reduction (prevention and diversion) targets.

Organizations should use an appropriate methodology to robustly measure food waste. They may wish to develop their own, work with their data provider or adopt an existing methodology.

Core recommendations

The core recommendations, for all organizations within the tourism sector, are as follows:

a) Define a 12-month period and scope of operations. As a minimum this should cover all operations that the organization owns, controls or influences (i.e., includes franchises);

b) Quantify the tonnage of food waste;

c) Identify whether the reported tonnage relates to edible parts only or includes associated inedible parts – it is encouraged to include both and possible to develop a ratio edible vs inedible which is updated on a regular basis;

d) Express food waste in terms of food waste (kg) per guest night (accommodation) or (kg) per guest day (cruise lines);

e) Identify additional intensity metrics that would be helpful for your organization to advance food waste reduction through the obtention of more granular data;

f) Where possible separately quantify the tonnage of food sent to redistribution/reuse:
   - Redistribution to people (e.g., through a charity or commercial redistributor);
   - Animal feed (e.g., unprocessed food for animals, when regulations permit); and
   - Biomaterial processing (e.g., feedstock for other industrial products).

g) Where possible separately quantify the tonnage of food sent to diversion (circulation):
   - Recycling (e.g., anaerobic digestion, composting, land spreading); and
   - Energy recovery (e.g., incineration with energy recovery).

h) Identify the percentage of food waste disposed (e.g., sent to landfill or incinerated – without energy recovery-, sewer or discharge to sea);

i) Identify the ratio of food waste diverted from landfill (and incineration) or discharge to sea; and

j) Describe the scope and methods of measurement and reporting.

Measurement methodologies and tools

Technology plays a significant role in measuring and managing food waste. **Digital measurement solutions**, such as smart scales and AI-powered analytics platforms, allow for precise tracking of food waste in real-time. These advanced tools help businesses identify waste patterns, enabling them to implement targeted waste reduction strategies. While digital measurement is more effective and accurate, it comes with higher costs compared to manual measurement methods. However, the long-term benefits of reduced food waste and improved operational efficiency often outweigh the initial investment, making digital solutions an attractive option for many businesses.

Manual measurement of food waste offers advantages, particularly for smaller businesses or those with limited budgets. It requires less upfront investment than digital solutions; it requires little technical expertise; and can be adapted to suit the specific needs of individual businesses or facilities.

The following are proven examples of good practice and provide further guidance:

Resource efficiency data and performance monitoring tool

The tool, developed under the International Climate Initiative (IKI) and UNEP Transforming Tourism Value Chains project, enables hotels and supporting organisations to collect data about resource efficiency and monitor their resource efficiency over time to see where their actions are having effects. It also provides information that can be used to produce a baseline for the hotels and Meetings, Incentives, Conferences & Exhibitions (MICE) industry of the tourism sector.

The tool is comprehensive in addressing energy, water and waste. Its direct value for the purposes of this Roadmap is the “Food Waste” worksheet, which allows for different levels of data input depending on the data available.

– Resource Efficiency Data and Performance Monitoring Tool | One Planet network:

WWF Hotel Waste Measurement Methodology

The methodology, developed with the support of an industry working group formed by leading hotel brands, aims to provide a consistent framework which the accommodation industry can use to track waste, including food waste, fill in data gaps, and report annual progress against goals. It also facilitates public reporting and industry benchmarking, supporting organizations to make progress towards best practice. A template for monitoring progress is included in Section 5 of the Methodology.

– Hotel Waste Measurement Methodology (by WWF)

WRAP Food waste reduction roadmap

WRAP and UK food businesses have agreed common recommendations for companies to measure and report food waste/surplus data, consistent with the Food Loss and Waste Accounting and Reporting Standard (FLW Standard).

– WRAP Food Waste Reduction Roadmap 2020 Toolkit

WRAP has also developed a global food surplus and waste reporting Data Capture Sheet (DCS) that is recommended across all sectors for any instances in which data is shared. It consolidates the key information requirements of the FLW Standard and the information that businesses will need to replicate in their food surplus and waste inventory from one year to the next (i.e. details on methods, assumptions, etc). Where organizations are at the early stages of measurement and reporting it may be more appropriate to use the simplified "Reporting Template" worksheet.

– Food loss and waste data capture sheet | WRAP

Metrics

Annual food waste tonnage is the minimum metric required. Whilst this is a first step it is not possible to monitor progress against the reduction target without an intensity metric. This is perfectly illustrated by the significant reduction in food waste tonnage experienced during the pandemic, where the reduction was attributable to the halt of tourism operations rather than to improvements in preventing food waste arising.

To demonstrate progress the following information is required:

Prevention target - accommodation providers and cruise lines: – Total food waste per annum (metric tonnes); – Total number of guest days or nights per annum; and – Food waste (kg) per guest day or night.
Diversion target - accommodation providers and cruise lines: – Total food waste per annum (metric tonnes); – Total food waste to landfill (or incineration) or discharge to sea per annum (tonnes); and – % food waste diverted (from landfill – or incineration- or discharge to sea).

Additional intensity metrics and comparable metrics

Additional intensity metrics, such as food waste per cover, offer valuable data granularity that complements the overarching metric of food waste per guest night. These supplementary metrics provide deeper insights into specific aspects of food waste generation, enabling businesses to pinpoint areas of inefficiency and implement targeted waste reduction strategies. The use of multiple metrics ensures a more comprehensive understanding of food waste patterns, ultimately leading to more effective and sustainable food management practices.

It is also possible to identify comparable metrics, when the purpose is to compare different entities, time periods or scenarios.

The following are additional intensity metrics and comparable metrics for the accommodation industry identified in the WWFs waste methodology: 

Table 4 **Additional intensity metrics and comparable metrics from the Hotel Waste Measurement Methodology**

Measure or metric	Type	Unit of measurement
Food waste per square metre	Comparable intensity metric	Kilograms
Food waste diversion rate	Comparable intensity metric	Percentage
Food waste per customer/ cover	Additional intensity metric	Any unit of weight, preferably per gram
Food waste per revenue	Additional intensity metric	Any unit of weight, preferably kilogram
Food waste per total food handled	Additional intensity metric	Any unit of weight, preferably metric tonne

In discussions about measurement approaches for the cruise sector, it was determined that both accommodation and cruise industries align to similar metrics to measure progress and success. No additional metrics were identified by the cruise industry.

Measurement and reporting practices

The diverse range of business models in the tourism sector means that it is not possible to prescribe, at this stage, a uniform methodology for measurement.

It is down to each organization to determine how best to effectively measure their food waste taking account of their specific circumstances and operating model. Organizations should regularly review their practices to see whether the scope can be increased and measurement improved.

Case study **Accor Hotels**

As part of its **Planet 21** sustainable development programme Accor Hotels introduced their "Food Waste Management" food waste reduction module. The tool was designed to be very simple to weigh discarded products. This weight is then converted into cost helping the hotel to identify priority areas in an effort to reduce costs and waste.

At the end of 2020, 1,882 hotels had implemented the "Food Waste Management" project. 482 hotels are precisely tracking the volumes of wasted food, 30% of which reached the objective of a 30% reduction.

Find out more at: www.oneplanetnetwork.org/programmes/sustainable-tourism/food-waste-reduction/case-studies.

The matrix below provides an example of how an organization can determine the effectiveness of their measurement practice. Organizations should aim to progress towards the right hand of the matrix for each activity.

Table 5 **Measurement and Reporting Matrix**

	Activity	Entry level	Good	Better			Best
1	**% of sites included in report**	<25%	>25%	>50%	>75%	>90%	100%
2	**% of sites contributing data**	<10%	>10%	>25%	>50%	>60%	>75%
3	**Measurement data capture**	WMC estimated	WMC actual	Mix of WMC data and site FW data e.g., 75%/25%	Mix of WMC data and site FW data e.g., 25%/75%	Site FW (as a whole)	Site WF split (spoilage, prep, plate, other)
4	**Method of measurement**	Estimated	Number of bins	Volume	Weighing scales	Weighting scales/ Smart meter	Smart meter
5	**Frequency of measurement**	Annual	Six monthly	Quarterly	Monthly	Weekly	Daily
6	**Period of measurement**	Single service	1 day	1 week	4 weeks	6-8 weeks	Continuous
7	**Scope of measurement**	Estimated from general waste	FW back of hause	+ plate waste	+ event waste (?)	+ drink waste	+ waste to server
8	**% of sites measuring on site**	0%	>1%	>10%	>25%	>50%	>75%
9	**Metric**	FW as % of sales	FW tonnage (FWT)	FWT/1,000 turnover sales	FW kg/guest night (or day)	FW g/cover	FWT/T of procurement
10	**Evidence**	No evidence of improvement	FW champion appointed	Action plan in place	Evidence of continuous imp	50% FW reduction achieved	>50% FW reduction achieved
11	**Other**						

WMC: Waste Management Contractor – **FW:** Food Waste

As an example, under Activity 3 “Measurement Data Capture” if an organization is using estimated weight of bin data from their waste management contractor (entry level) then they should put in place an action to work with their contractor to provide actual weight data (good). A better and more beneficial approach would be to put in place a measurement system within the kitchen itself (better/best).

Matrix example **Hotel Group With 15 Sites**

The measurement practice of a fictional hotel chain can vary across the activities shown in the matrix above and therefore the matrix provides guidance to continue improving performance.

Activity 1: Data has been extrapolated to the full estate for inclusion in the report i.e. 15/15 (100% – best);

Activity 2: 13 hotels are contributing data i.e. 13/15 (86% – best);

Activity 3: The main data source is from the waste management contractor (WMC), verified (moderated) by 2 sites (86%/14% – better);

Activity 4: Method of measurement within the 2 sites is weighing scales – better;

Activity 5: Measurement is carried out on a monthly cycle – better;

Activity 6: Food waste is measured for 1 day – good;

Activity 7: Food waste reported includes plate waste – better;

Activity 8: 2 sites are measuring on site i.e. 2/15 (>10% – better);

Activity 9: Annual food waste is reported as kg/ guest night – better; and

Activity 10: A FW champion has been appointed to progress the Action Plan to deliver the target – good.

Step 3: **Taking action**

The Roadmap recommends organizations to develop an Action Plan, or update an existing one, and implement it to reduce food waste in tourism operations, help guests reduce their food waste and work in partnership with suppliers to reduce supply chain waste.

There are two key action areas:

1. **Own operations**
   - Strategic – company level;
   - Site operations – hotel / ship level; and
   - Staff empowerment.

2. **Guest engagement**
   - Example actions for each area are given below. These can be adapted, developed and turned into an Action Plan checklist to reflect the organization's priorities. It is recommended that organizations deliver or develop three actions (as a minimum) over a period of 6 months, review, evidence and once achieved select a further three actions and seek to progress through Good – Better – Best as part of the continuous improvement cycle (see Table 5 above). This progression can be used as evidence of delivery alongside the corresponding percentage reduction in food waste.
   - The Action Plan should ideally be made public.

Own operations

Strategic – company level

Table 6 **Recommended Strategic Actions – company level**

			Action		
Ref.	**Ambition**	**Delivery mechanisms**	**Good**	**Better**	**Best**
1	Demonstrate action on food waste reduction	– Public statement from C-Suite – Food waste reduction policy – Food waste reduction in corporate social responsibility (CSR) or environmental, social and governance (ESG) strategies	We have committed to reduce food waste in line with Roadmap recommendations	We have agreed a target for food waste reduction	We have included the agreed target in public documents e.g., CSR or ESG strategies
2	Identify interventions for food waste reduction at company level	– Food waste reduction action plan	Food waste reduction action plan with short term interventions (6 months)	Food waste reduction action plan with medium term interventions (12 months)	Food waste reduction action plan with long term interventions (>12 months)
3	Address food waste as an accelerator for more sustainable management of food and GHG emissions reduction	– Sustainable food management action plan – including Food waste reduction and GHG emissions reduction – Sustainable food management policy / CSR or ESG Strategies including Food waste reduction and GHG emissions reduction	Sustainable food management action plan – including food waste reduction and GHG emissions reduction with short term interventions (6 months)	Sustainable food management action plan – including food waste reduction and GHG emissions reduction with medium term interventions (12 months)	Sustainable food management action plan – including food waste reduction and GHG emissions reduction with long term interventions (>12 months)
4	Track and demonstrate progress on food waste reduction (prevention/ redistribution/diversion from landfill or discharge at sea) at company level	– Measurement and reporting in line with the Roadmap recommendations	We have established a baseline from measurement data	We track progress against the target (annually as a minimum) and report progress publicly	We report progress publicly and aim at increasing the number of sites tracking and measuring food waste reduction
5	Embed food waste reduction within organizational operations and cultures by developing food waste prevention/ redistribution/diversion key performance indicators (KPIs).	– Develop KPIs (e.g., number of meals saved/ donated; tonnes of FW for recycling; etc.)	Establish KPIs for senior management on food waste reduction	Review KPI progress regularly	Managers and teams are assessed/ incentivised against KPIs

Table 7 **Recommended Actions for Site operations – hotel / ship level**

Ref.	Ambition	Delivery mechanisms	Action		
			Good	Better	Best
TARGETS AND MEASUREMENT					
1	Understand where site food waste is generated	Food waste audit/ assessment	We track food waste data at site level	We track food waste data at site level and map where food waste is generated e.g., deliveries, kitchen	We track food waste data at site level and map where food waste is generated including buffet, overproduction and plate waste
2	Track and demonstrate progress on food waste reduction (prevention/ redistribution/diversion from landfill or discharge at sea) at site level	Measurement and reporting in line with the organization's policy / action plan	We have established a baseline from measurement data and have set a target for reduction	We track progress against the target	We report internally on progress achieved and challenges faced
3	Establish reliable data sets at site level	– Paper based tracking sheet – Smart meters – Electronic points of sale	We measure, record and report food waste periodically (e.g., quarterly)	We measure, record and report our food waste regularly (monthly)	We measure, record and report our food waste regularly (daily)
PLANNING					
4	Identified appropriate interventions to reduce food waste (prevention, redistribution, diversion)	Site level food waste reduction action plan	We have an action plan in place with short term interventions (3-6 months)	We have an action plan in place with medium term interventions (12 months) e.g., carry out food waste audits to identify the causes and opportunities for reduction	We have an action plan in place with long term interventions (> 12 months) e.g., kitchen production plans are dynamic and aim to reflect recent patterns, seasonality, weather and events
5	Identify suppliers that are committed to sustainability and minimizing food waste	– Service agreement contracts – Supplier dashboard	Our procurement questionnaire includes a section on sustainability	Assessment of suppliers' tender includes their approach to food waste reduction	We include clauses on food waste reduction and diversion in our supplier contract
6	Engage suppliers and logistics providers to identify causes of waste and to find solutions which can save money for all	– Service agreement contracts – Transparency and information disclosure	We encourage our suppliers to share information on the causes of waste and traceability of products	We collaborate with suppliers to identify sustainable procurement options that reduce waste and GHG emissions	We implement sustainable procurement strategies that reduce food waste in the supply chain (e.g., by purchasing "ugly" vegetables)

Ref.	Ambition	Delivery mechanisms	Action		
			Good	Better	Best
PREVENTION					
7	Implement strategies to prevent food waste when receiving and storing food[99]	– Ensure correct items are delivered – Ensure inventory best practices are applied – Review food stored regularly – Clearly label products with purchase and use-by dates – Extend shelf life by vacuum packing, freezing and marinating – Dedicate food waste bins to identify challenges in receiving and storage areas – Segregate waste	We are paying attention at food waste generated in receiving and storage areas	We have identified opportunities to address challenges in receiving and storage areas and are implementing them	We have maximized the reduction of food waste from receiving and storage areas
8	Implement strategies to prevent food waste when preparing meals[100,101]	– Check headcounts close before starting preparation and plating of food – Ensure accurate portioning – Use waste trends to adjust volumes and minimise overproduction – Adjust portion sizes for specific items where plate waste is an issue – Prepare items such as breads, cakes and desserts in house to control volumes on daily basis – Introduce “live cooking” upon request – Introduce “dish of the day” – Plan a second use for meals in the event of overproduction – Set aside food scraps for animal feed (where regulations allow) – Dedicate a food waste bin to each preparation station to identify challenges – Segregate waste			

Ref.	Ambition	Delivery mechanisms	Action		
			Good	Better	Best
PREVENTION					
9	Implement strategies to prevent food waste when serving meals[102,103]	– Display foods horizontally instead of pilling for items and top up when necessary – Use single portions towards the end of a buffet – Use dispensers and jars – Reduce plate size and shrink serving utensils – Offer sample servings at the buffet – Label the ingredients to avoid extensive tasting – Introduce "show cooking" for some high value items – Track which items went unused, overset or wasted on guest plates – Offer different portion sizes in à la carte menu – Dedicate a food waste bin to identify challenges related to plate waste – Segregate waste	We are paying attention at food waste generated when serving meals	We have identified opportunities to address challenges in serving meals and are implementing them	We have maximized the reduction of food waste from served meals
REDISTRIBUTION					
10	Implement strategies to repurpose surplus food for human consumption	– Menu planning – Standard operating procedure	We make surplus food available via the staff restaurant	We repurpose surplus food in dishes e.g., specials	We use menu planning to reduce surplus food to a minimum
11	Implement strategies to redistribute surplus food for human consumption	– Local redistribution (in line with local redistribution laws) – Donation programme – Standard operating procedure	We understand local redistribution laws and have identified apps, charities and food banks	We redistribute surplus food partially via apps, charities and food banks	We redistribute all our surplus food via apps, charities and food banks
12	Implement strategies to redistribute surplus food for animal feed or industrial processes	– Animal feed (unprocessed – where regulations allow) – Nutrients recovery – Biomaterial processing	We understand local regulations and have identified potential partners	We are piloting partnerships to redistribute pertinent surplus food items for animal feed or industrial processes	We have functioning partnerships to redistribute pertinent surplus food items for animal feed or industrial processes

Ref.	Ambition	Delivery mechanisms	Action		
			Good	Better	Best
DIVERSION (CIRCULATION)					
13	Implement procedures to divert (circulate) food waste from landfill (or incineration) and discharge to sea (e.g. through composting, anaerobic digestion or incineration with energy recovery)	– Explore composting or anaerobic digestion on-site – Develop agreements with waste managers to circulate food waste – Request options to circulate food waste from local authorities	We understand local regulation and engage with waste managers to identify options for diversion (circulation) of food waste from landfill or discharge to sea	We implement options to divert (circulate) food waste from landfill or discharge to sea	We track and report diversion (circulation) of food waste from landfill or discharge to sea

Staff empowerment

Table 8 **Recommended actions for staff empowerment**

Ref.	Ambition	Delivery mechanisms	Action		
			Good	Better	Best
1	Recruit and recognise staff with food waste reduction skills	– Job descriptions – Establish a food waste reduction and management team – Food waste reduction ambassadors	Our sustainability objectives are reflected in our job descriptions	Our job descriptions empower staff to implement food waste reduction changes	Our roles recognise and reward specific responsibilities for sustainability and food waste reduction
2	Awareness and engagement of food waste reduction activities embedded within organization[104]	– Engage leadership – Inform and train staff – Encourage collaboration across staff members (initiatives)	Our staff induction includes an introduction to our sustainability objectives, including food waste reduction	Our staff is coached, mentored and invited to propose food waste reduction strategies	Our staff is trained regularly, including on food waste measurement and reporting, and supported to implement changes
3	Reviewing food waste is part of organizational practice	– Suggestion box – Kitchen talks – Staff meetings – Tracking food waste reductions	We review food waste reduction progress and empower staff to make positive change	We share knowledge and improvements with other sites/ teams	We encourage and enable teams to share their work beyond the organisation

Guest engagement

Table 9 **Recommended actions for guest engagement**

Ref.	Ambition	Delivery mechanisms	Action		
			Good	Better	Best
1	Raising awareness of sustainability commitment to guests	– Food waste reduction plan – CSR or ESG strategies – Booking systems – Website – In room info systems – Table talkers	Our sustainability objectives are reflected in our job descriptions	Our job descriptions empower staff to implement food waste reduction changes	Our roles recognise and reward specific responsibilities for sustainability and food waste reduction
2	Support guests with decision making to reduce food waste without affecting their enjoyment[105]	– Table talker info – Posters/ banners – Creative food tags – Buffet signs – Menus – Display screens (venue / rooms) – Booking emails – Offering meal selection at the time of check-in – Use loyalty programmes to profile guests food preferences	We support our guests to reduce their impact on food waste through table talkers	We inform guests how they can reduce their impact through menu design (e.g., portion size options)	In addition to sharing progress on our targets we illustrate with examples of on-site changes that make a difference
3	Empower staff to talk to guests about menu options to support ordering appropriate amounts	– Kitchen talks – Story telling	Our staff highlight the table talkers to guests and encourage them to ask questions	Our staff inform guests about menu options and choices e.g., ingredients, refill options, sides included and highlighting portion options	Our staff highlight to guests the changes that have been made to reduce our environmental impact
4	Engage guests and staff to raise awareness that food waste reduction can continue at home	– Display screens – Follow up email – Suggestions box – Social media communications	We promote food waste prevention initiatives to both guests and staff to help embed food waste reduction at home	We utilise social channels with staff and guests to encourage food waste reduction action at home	We share regular updates and insights through social channels on top tips for reducing food waste at home
5	Develop a policy to support food waste reduction at events, meetings and conferences	– Food waste reduction policy – CSR or ESG strategies – Surplus food policy / procedure	We highlight our commitment to food waste reduction on our website and booking form	We support event clients to specify what is required and enable surplus food policy to be implemented	We include a charge to event clients who over order food that can no longer be eaten

Step 4: **Report**

The Roadmap recommends organizations to report annually on progress against their food waste reduction targets to **showcase successes, share learnings and challenges with other stakeholders and trigger changes at scale.**

Organizations should publicly report their results, or work towards this best practice, and share successes and lessons learned. Data in the public domain is critical, because it makes it possible for countries to track their progress in delivering SDG target 12.3. on halving food waste by 2030 and to report under the Food Waste Index, the official UN food waste indicator. As a minimum organizations should share data via their website and sustainability reports. In addition, reports can be done internally and/or certified by external bodies. Where appropriate, results can also be shared with the relevant membership organization who can publish aggregated data, thereby demonstrating the sector's progress. Data can also be shared via the One Planet network online platform for knowledge sharing: https://www.unwto.org/sustainable-development/one-planet.

Waste reporting in hospitality

- A recent report[106] from UNEP identified that out of the 50 largest hotel groups, only 26 currently report on waste, and their reporting differs widely in terms of quality.

From those reporting, it can be concluded that:

- 62% of hotels set at least one corporate target on waste. However, COVID-19 has slowed down commitments and progress towards a circular economy by pushing targets into the future, holding back initiatives and slowing down portfolio-wide adoption;
- Reducing food waste is high on the agenda;
- Disclosure on food waste is steadily advancing; and
- The hospitality industry lacks a consistent and unified way to measure waste.

Taking the above UNEP findings into account, organizations should be as robust and transparent as possible in their reporting. Such an approach allows the organization to demonstrate progress on food waste reduction to its guests, shareholders and other stakeholders. It also allows the organization to generate business and reputational benefits from their actions and be held publicly accountable for them. Recommended minimum requirements are given below.

Food waste prevention reporting

When reporting publicly, the organization should include the following information:

I. % food waste reduction target;
II. Baseline year and target year;
III. Annual tonnage of food waste;
IV. Annual number of guest days or guest nights;
V. Food waste (kg) per guest days or guest nights;
VI. Progress against the % food waste reduction target – year on year and cumulatively – (see example below);
VII. Actions they have implemented and are taking to reduce food waste; and
VIII. [Separately, food surplus total annual tonnage (redistributed or sent for animal feed)].

Note: The separate reporting of food surplus, namely any material that is sent for redistribution to people, animal feed or, conversion into industrial products, is encouraged.

Whilst it is not necessary to report on food surplus it is helpful to capture this information for the purposes of the organization's ESG reporting. This helps demonstrate to guests and investors alike that the organization is committed to reducing food waste and reducing its impact on food security and the environment.

Food waste diversion reporting

When reporting publicly, the organization should include the following information:

I. Diversion from landfill/ discharge to sea target – either % reduction or zero;
II. Baseline year and target year;
III. Annual tonnage of food waste;
IV. Annual tonnage of food waste sent to landfill (or incineration) and discharge to sea;
V. Percentage (%) of food waste sent to landfill (or incineration) and discharge to sea;
VI. Progress against the diversion from landfill (or incineration) and discharge to sea target – year on year and cumulatively – (see example below); and
VII. Actions they have implemented and are taking to divert food waste.

How should performance against the target be reported?

As part of the annual data reporting, the organization will need to report on progress towards their target. To aid data comparison the method used to determine the reported figures should be described. Reporting should compare progress against the previous year and against the baseline year – as a relative change in the amount of food waste.

Examples of summary reporting

Food waste prevention reporting

Table 10 **Example of food waste prevention reporting**

Baseline year		Target year		Target % food waste prevention	
2022		2030		50	
Reporting period	**Total annual food waste (t)**	**Guest day or night**	**Food waste per guest day or night (kg)**	**Year on year reduction (as percentage of previous year) (%)**	**Cumulative reduction (over baseline) (%)**
(Baseline) 2022	500	10,000	0.050	-	-
2023	550	11,200	0.049	2.0	2.0
2024	470	10,400	0.045	8.2	10.0
2025					

Plus a narrative on calculations and the methodology used, progress and actions implemented.

Note: To calculate the year-on-year reduction in food waste per guest day or night, use the formula: ((previous year's value - current year's value) / previous year's value) × 100%.

To calculate the cumulative reduction in food waste per guest day or night over the baseline year, use the formula: ((baseline year's value - current year's value) / baseline year's value) × 100%.

Food waste diversion reporting

Table 11 **Example of food waste diversion reporting**

Baseline year		Target year		Target % food waste prevention	
2022		2030		50	
Reporting period	**Total annual food waste (t)**	**Food waste to landfill (or incineration) or discharge at sea (t)**	**% Food waste to landfill (or incineration) or discharge at sea (%)**	**Year on year diversion (as percentage of the previous year) (%)**	**Cumulative diversion (over the baseline) (%)**
(Baseline) 2022	500	500	100.0	-	-
2023	550	420	76.4	23.6	23.6
2024	470	315	67.0	12.2	33.0
2025					

Plus a narrative on calculations and methodology used, progress and actions implemented.

Note: To calculate the year-on-year progress in food waste diversion from landfill (or incineration) or discharge at sea, use the formula: ((current year's value - previous year's value) / previous year's value) × 100%.

To calculate the cumulative progress in food waste diversion from landfill (or incineration) or discharge at sea over the baseline year, use the formula: ((current year's value - baseline year's value) / baseline year's value) × 100%.

Example of Food Waste Data Reporting template from Guardians of Grub

3.2 Collaborative approaches can trigger changes at scale

To meet the targets proposed by the Roadmap on food waste reduction (through prevention, redistribution and diversion -circulation-) at sector level, collaborative and concerted efforts are required.

Collaborative approaches in the context of food waste reduction can trigger changes at scale by fostering precompetitive collaboration among key stakeholders in the tourism sector. By working together, businesses can share best practices, pool resources, and jointly develop innovative solutions that drive systemic change across the entire sector.

Concerted efforts not only accelerate the sustainable management of food in tourism, but also contribute to create a level playing field where all tourism stakeholders can benefit from reduced food waste and its associated environmental, social, and economic advantages.

Every organization in the tourism sector can play its part by taking action to reduce food waste in tourism operations and by helping suppliers and guests to do the same.

In addition to accommodation providers and cruise lines which are the primary focus of the Roadmap, associations (business associations and NGOs), can also play a role by encouraging their members to take action. The table below illustrates collective milestones that the Roadmap aims to achieve:

Table 12 **Sector specific milestones**

Indicator	Milestones			
	2023	2025	2027	2030
Accommodation No. of 50 largest hotel groups implementing Roadmap recommendations	25	35	40	50
Cruise No. of 10 largest cruise ship brands implementing Roadmap recommendations	5	7	9	10
Total No. of organizations implementing Roadmap recommendations (including associations and small medium size enterprises (SMEs))	40	70	100	250

In addition, tourism authorities and destination management organizations should take the lead integrating food waste reduction as part of tourism policies, regulations and incentives. By supporting infrastructure development in collaboration with waste management authorities, capacity building, and public awareness campaigns, they can drive collective action among all stakeholders in the destination, including hotels, restaurants, tour operators, and tourists.

Engaging as many stakeholders as possible in the implementation of the Roadmap recommendations would be key to ensure the transition of the tourism sector to zero food waste to landfill (or incineration) and discharge to sea.

Limitations of the Roadmap

The Roadmap represents a significant collaborative effort. Nevertheless, there are areas that could be further enhanced and addressed to support stakeholders tackling food waste reduction. For instance:

Scope: The recommendations of the Roadmap are primarily addressed to accommodation and cruise industries. Nevertheless, the involvement of national and sub-national tourism authorities and destination management organizations would be crucial to ensure the enabling conditions and promote precompetitive collaboration across private sector stakeholders and further guidance would be supportive. The aviation industry can also play an important role tackling food waste reduction and faces particular challenges pending to be addressed.

Targets: Further guidance on the use of additional metrics to complement the overarching target proposed by the Roadmap, for instance highlighting a variety of scenarios where specific metrics provide more benefits, would be helpful for stakeholders. Data granularity facilitates the identification of actionable steps; it can be enhanced over time as staff become trained and empowered to manage more precise measurements, differentiate between preparation, service, and plate waste, or pinpoint specific causes of food waste, such as overproduction, spoilage, excessive trimming, or serving overly large portions.

Measurement: Practical advice to effectively combine direct measurement with extrapolations is needed. Methodological guidance would be also helpful to consistently identify which food service areas (e.g., room service, snack bars, event venues, and main restaurants) are to be included or excluded from the measurement, as not all locations would be able to accurately measure, The viability of measuring drink waste remains to be assessed. Recommendations on ways to involve franchised businesses would be useful.

Baseline: Defining a minimum threshold for data requirements and offering a methodology for establishing baselines, considering rolling events and seasonal variations, would be helpful.

Reporting: Developing an aggregated reporting mechanism to track the implementation of the Roadmap recommendations and demonstrate collective progress would enhance the positioning of the sector and further promote the exchange of knowledge across stakeholders.

Training: The development of training modules would support the engagement of stakeholders to implement the recommendations of the Roadmap. Small medium size enterprises (SMEs))would require additional training and support.

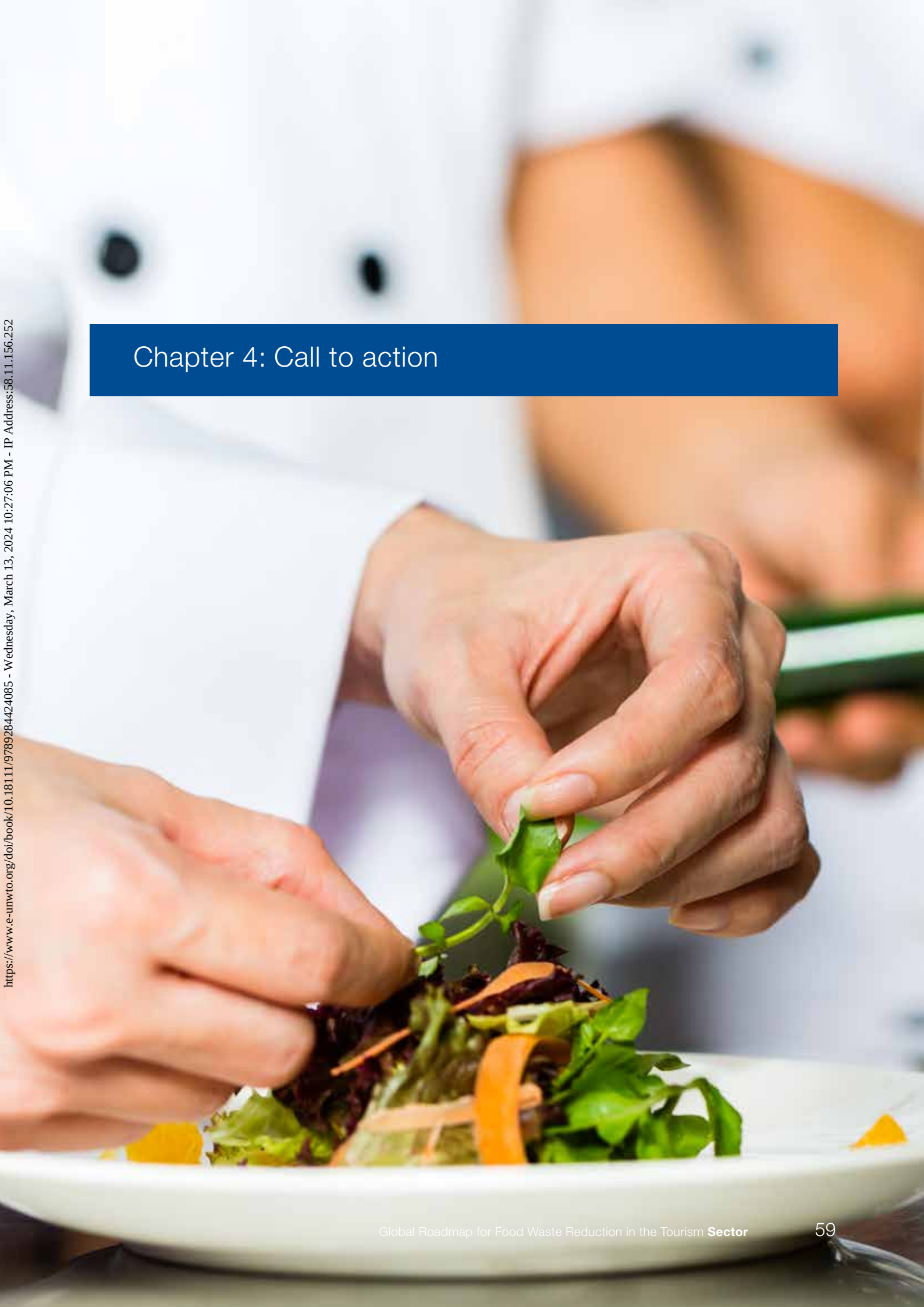
Tools: The tools presented in the Roadmap are not exhaustive and could be refined after testing by stakeholders so as to better suit the needs of tourism stakeholders. New tools and templates might need to be developed.

Infrastructure: A mapping of waste management infrastructure at the municipal level is currently unavailable, which restricts the planning of circular processes to be applied.

Regulations: There is a lack of information on the application of ICW regulations at the local level. The forthcoming International Standard on food waste will influence future developments in this field.

Through continuous collaboration and refinement, the action framework presented in the Roadmap will evolve to address these concerns and further support stakeholders in their food waste reduction efforts.

Chapter 4: Call to action



There is a real need for the tourism sector to act now to build a resilient and sustainable future for itself and the planet.

There is a clear business case for, and multiple benefits to be realised from, reducing food waste within an organization. Addressing food waste should be seen as a management tool to facilitate continuous improvement of business efficiency, helping to identify hotspots against which action can be taken to reduce operational costs, lower the impact of wasted food on the environment and to demonstrate to guests, shareholders and other stakeholders the commitment of the organization towards reducing GHG emissions and supporting food security.

Implementing the recommendations of the Roadmap - setting a target, measuring progress and putting in place an Action Plan to reduce food waste - is good for business, can help reduce food poverty and is good for the environment, while directly supporting the delivery of the SDGs.

All tourism stakeholders are strongly encouraged to implement the recommendations of the Global Roadmap for Food Waste Reduction in Tourism.

The One Planet Sustainable Tourism Programme's work stream on food waste reduction

UNWTO, through the One Planet Sustainable Tourism Programme, remains committed to support tourism stakeholders in the reduction of food waste through prevention, redistribution and diversion from landfill (or incineration) and discharge to sea (through the application of circular processes), so as to continue building consensus on the most optimal way forward to trigger changes at scale.

As next steps, the Roadmap will be promoted to reach a wide range of stakeholders, a data base of case studies will be enabled to showcase best practices and promote exchanges of knowledge across tourism stakeholders. It is also expected to follow up on the limitations of the study.

The One Planet Sustainable Tourism Programme has a repository of resources focusing on the sustainable management of food, with special emphasis on food waste.

To access the repository, please visit: https://www.oneplanetnetwork.org/programmes/sustainable-tourism/food-waste-reduction/tools-resources

If you have resources that you would like to share with others, please email oneplanetstp@unwto.org.

Definitions

FOOD AND TYPES OF FOOD WASTE

Food

Any substance – whether processed, semi-processed or raw – that is intended for human consumption. "Food" includes drink, and any substance that has been used in the manufacture, preparation or treatment of food. "Food" also includes material that has spoiled and is therefore no longer fit for human consumption. It does not include cosmetics, tobacco or substances used only as drugs. It does not include processing agents used along the food supply chain, for example water to clean or cook raw materials in factories or at home.[107]

Food by-products

A by-product is an output from a production process that is not the main intended product but which has a value as an input to other food, feed or non-food markets. To qualify as a by-product the material must meet certain criteria (e.g., have value and be certain to find a market).

Examples include grain leftover from brewing sent for animal feed and whey created during the production of dairy products and sold for protein production. Neither of these examples would be considered food waste based on the interpretation of the scope for SDG 12.3.[108]

Food loss

Food losses are all the crop and livestock human-edible commodity quantities that, directly or indirectly, completely exit the post-harvest/ slaughter production/supply chain by being discarded, incinerated or otherwise, and do not re-enter in any other utilization (such as animal feed, industrial use, etc.), up to, and excluding, the retail level. Losses that occur during storage, transport and processing, also of imported quantities, are therefore all included. Losses include the commodity as a whole with its non-edible parts.[109]

For the purposes of the Roadmap food loss is out of scope.

Food surplus

Food surplus refers to food that is redistributed for consumption by people, used for animal feed or used for bio-based materials / biochemical processing.

Food system

Food system refers to the constellation of activities involved in producing, processing, transporting and consuming food.[110]

Food waste

Defined as food (see above definition, including drink) and associated inedible parts removed from the human food supply chain in the following sectors: manufacturing of food products (under certain circumstances); food/grocery retail; food service (tourism); and households.

"Removed from the human food supply chain" means one of the following end destinations: landfill; controlled combustion; sewer; litter/discards/refuse; co/anaerobic digestion; compost/aerobic digestion; or land application (or discharge to sea).[111]

Food waste: edible parts

"Food" (see definition, including drink) that is removed from the human food supply chain. See also "inedible parts".[112]

Food waste: inedible parts

Components associated with a food that, in a particular food supply chain, are not intended to be consumed by humans. Examples of inedible parts associated with food could include bones, rinds and pits/stones. "Inedible parts" do not include packaging.

What is considered inedible varies among users (e.g., chicken feet are consumed in some food supply chains but not others), changes over time, and is influenced by a range of variables including culture, socio-economic factors, availability, price, technological advances, international trade and geography. See also "edible parts".[113]

FOOD WASTE MANAGEMENT STRATEGIES

Please note that in waste management jargon, the processes below are known as "food waste destinations". For the purpose of the Roadmap and to avoid confusion with "tourism destinations", the term "food waste strategies" has been preferred.

Redistribution

(listed in order of appearance in the food waste hierarchy)

Redistribution to people

In the context of waste prevention, only include redistributed surplus food where the food would otherwise have ended up as waste or would have been sent to one of the other destinations below. This may include food redistributed by both charitable and commercial organizations. Where surplus is sold, explain why this qualifies as waste prevention. Do not include food that is produced or provided expressly for donation.[114]

Animal feed

Diverting food and/or inedible parts, directly or after processing, to animals where permitted.[115]

Bio-based materials/biochemical processing

This refers to destinations in which food and/or inedible parts are 'valorised' by conversion into industrial products. Examples include creating fibres for packaging material, creating bioplastics (e.g., polylactic acid), rendering into a raw material to make products such as soaps or cosmetics. If material is sent to this destination and accounted as 'surplus', rather than 'food waste', businesses should undertake due diligence with the recipient of the material to ensure that valorisation into other industrial products occurs, takes place as intended (e.g., producing saleable products for chemicals, packaging markets, saleable biodiesel, etc.) [116]

Circulation

(listed in order of appearance in the food waste hierarchy)

Anaerobic digestion/codigestion

Breaking down material via bacteria in the absence of oxygen. This process generates biogas and nutrient-rich matter that can be used as fertiliser. Codigestion refers to the simultaneous anaerobic digestion of food waste and other organic material in one digester. This destination includes fermentation (converting carbohydrates – such as glucose, fructose, and sucrose – via microbes into alcohols in the absence of oxygen to create products such as biogas).[117]

Composting/aerobic processes

Breaking down material via bacteria in oxygen-rich environments. Composting refers to the production of organic material (via aerobic processes) that can be used as a soil modifier.[118]

Land spreading

Spreading, spraying, injecting, or incorporating organic material onto or below the surface of the land to enhance soil quality.[119]

Incineration/controlled combustion

Sending material to a facility that is specifically designed for combustion in a controlled manner, which may include some form of energy recovery (this may also be referred to as incineration). This does not include a bonfire or basic on-site incinerator bin.[120]

Disposal

(listed in order of appearance in the food waste hierarchy)

Landfill

Sending material to an area of land or an excavated site that is specifically designed and built to receive wastes.[121]

Send/discharge to sea/sewer/wastewater treatment

Sending material to sea or to sewer (with or without prior treatment), including that which may go to a facility designed to treat wastewater.[122]

Other (including uncontrolled disposal)

Sending material to a destination that is different from those listed above. It might include material included with the 'Refuse/discards/litter' destination defined in the FLW Standard – which encompasses open dumps (i.e. uncovered, unlined), open burn (i.e. not in a controlled facility), and fish discards. If including this destination in your inventory you should describe what it includes in supporting notes.[123]

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The *Global Roadmap for Food Waste Reduction in the Tourism Sector* is designed to accelerate the uptake of food waste reduction strategies by tourism stakeholders.

The Roadmap aims to raise awareness of the potential benefits and opportunities of achieving a more sustainable, circular management of food, with a special emphasis on reducing waste as both a cost-effective and environmentally responsible strategy.

The Roadmap sets out how the tourism sector can contribute to the achievement of target 12.3. of the Sustainable Development Goals (SDGs) which aims at halving global food waste by 2030.

It provides an action framework to accelerate food waste reduction in tourism, sharing practical insights and guidance for the sector, with a particular focus on supporting accommodation providers and cruise lines to scale up impacts.

The **World Tourism Organization (UNWTO),** a United Nations specialized agency, is the leading international organization with the decisive and central role in promoting the development of responsible, sustainable and universally accessible tourism. It serves as a global forum for tourism policy issues and a practical source of tourism know-how. Its membership includes 159 countries, 6 territories, 2 permanent observers and over 500 Affiliate Members.

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