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# THE STATE OF FOOD WASTE IN WEST ASIA



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## FOREWORD:



We are happy to introduce *The State of Food Waste in West Asia*. This report is aligned with international efforts to meet the Sustainable Development Goal 12 (SDG 12), which seeks to “ensure sustainable consumption and production patterns.” Under this goal, the third target (Target 12.3) calls for halving per capita global food waste at the retail and consumer level, in addition to reducing food loss along the production and supply chains by 2030. Given the considerable amount of wasted food annually and its repercussions on food security, the environment, the economy, natural resources and livelihoods, our report sheds light on food waste in West Asia.

West Asia includes 12 countries with differences in income, industrialization and development levels. It is well documented that in developing or low-income countries, around two-thirds of the food produced is lost post-harvest and during processing, whereas in developed or medium- to high-income countries, a significant fraction of food waste is generated at the consumption level. This report considers the food waste issue at the household, food service, and retail levels, focusing on its ramifications for food security, given that the amount of food waste generated annually is enough to feed the 8 million undernourished people living in West Asia. Furthermore, the report summarizes the effects of the COVID-19 pandemic on food waste generation, as assessed in a cross-sectional study surveying perceptions of food waste generation, and provides recommendations to mitigate the pandemic’s effect in this regard.

This report on the state of food waste in West Asia lists the existing private and public interventions to mitigate food waste. It builds on the current efforts to set targets, propose national strategies and develop policies to deliver SDG 12.3. Our report presents new methods to deal with food waste treatment and a sustainable framework to support this.

The report on the state of food waste in West Asia is commissioned by the UN Environment Programme’s West Asia Office. We would like to thank all those who contributed to this report.

A handwritten signature in black ink, appearing to read 'Sami Dimassi', written in a cursive style.

Sami Dimassi

Director and Regional Representative  
West Asia Office

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## LIST OF ABBREVIATIONS

<b>CO<sub>2</sub></b>	Carbon dioxide
<b>EU</b>	European Union
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>NDC</b>	Nationally Determined Contribution
<b>SDG</b>	Sustainable Development Goal
<b>UK</b>	United Kingdom
<b>UN</b>	United Nations
<b>UNEP</b>	United Nations Environment Programme
<b>WRAP</b>	Waste and Resources Action Programme
<b>VAT</b>	Value-added tax



## EXECUTIVE SUMMARY

The *State of Food Waste in West Asia* report was commissioned by the United Nations Environment Programme West Asia Office. It is timely coming after the publication of the Food Waste Index 2021 report (UNEP 2021) and dives into the challenges of the West Asia region. West Asia comprises 12 countries and territories: Kingdom of Bahrain, Republic of Iraq, The Hashemite Kingdom of Jordan, State of Kuwait, Republic of Lebanon, Sultanate of Oman, State of Palestine, State of Qatar, Kingdom of Saudi Arabia, Syrian Arab Republic, United Arab Emirates, Republic of Yemen.

The region has unique features related to its culture, religion and history that create substantial challenges related to food waste.

Food loss and food waste are challenging ethical issues in a world where more than 1 billion people continue to suffer from undernourishment. Food loss occurs during the production and distribution of the food supply chain, whereas food waste occurs at the retail and consumer levels. This report focuses on the current state of food waste in West Asia and on existing efforts, gaps and opportunities. It advocates sustainable food waste management for West Asia, an area that is historically known for producing high amounts of food waste, so it complements the region's efforts to end poverty, reduce hunger and improve human health.

Food waste reduces the availability of food intended for human consumption and has ramifications for the environment, natural resources and the economy. Around one-third of global food production is lost or

wasted every year along the supply chain from farm to fork. This loss or waste is enough to mitigate the global challenge of meeting the increased demand for food and feed more than 12 per cent of the global population, lifting them out of hunger and malnutrition.

In 2015, the United Nations General Assembly adopted a set of Sustainable Development Goals (SDGs), one of which is SDG 12, which aims to “ensure sustainable consumption and production patterns”. Under this goal, the third target (Target 12.3) calls for halving per capita global food waste at the retail and household levels and reducing food loss along the supply chains by 2030. In addition, it is important to tackle food waste in West Asia as a means to reduce pressure on landfills and minimize methane emissions that contribute to climate change.

Food waste in West Asia is alarming as it represents an estimated 34% of the total food served. The region is also home to annual religious festivals, such as the Hajj and Ashoura, that generate significant amounts of food waste over short periods. During Ramadan, 30-50 per cent of the food prepared in Saudi Arabia is thrown away; these shares reach 25 per cent in Qatar and 40 per cent in the United Arab Emirates. The increase in food waste during Ramadan is attributed to the preparation of extravagant meals that far exceed families’ needs, and leftovers are thrown away. Furthermore, food wasted at an average wedding in Mecca, Saudi Arabia can be sufficient to feed 250 hungry people.

Food waste is affected by different factors at the household, food service and retail levels:

- At the household level, factors that affect food waste include appearance and taste expectations, socioeconomic status, shopping attitudes, insufficient knowledge, errors in packaging and health misconceptions about leftovers.
- At the food service level, packaging sizes, sale promotions and discounts contribute greatly to food waste generation. Food waste in the food service sector is due mainly to standardized portion sizes that exceed the needs of individuals; to difficulties in anticipating demand; and to cooking practices.
- At the retail level, factors affecting food waste include the oversupply of foodstuffs, efforts to meet customers’ desires to see frequently full shelves

and consumers’ tendency to avoid buying items with nearing “expiration” or “best by” dates. Improper handling and storage of food items, and errors in packaging and labelling or cross-contamination and adulteration also contribute to food waste.

There is a lack of general awareness coupled with a scarcity of data and information on food waste across West Asia. Although 10 countries have adopted related legislation, most countries still lack well-designed and enforceable policies and regulations on food waste reduction. In recognition of the problem of food waste in West Asia awareness campaigns (Food Forward UAE, I’M PERFECT campaign) and food banks in at least 10 countries have been put in place. At the governmental level, only two countries have committed to halving food loss and waste by 2030 (Saudi Arabia and the United Arab Emirates). Saudi Arabia is the only country in the region that has conducted a national quantitative assessment of food loss and waste.

To mitigate food waste in West Asia, efforts are needed to encourage the adoption of enhanced behavioural practices among food providers and consumers and enhance intra-regional trade and continued investments in the modernization of the food supply chain., Countries should measure their baselines, adopt national targets and strategies consistent with SDG 12.3, support supply chain collaboration to eliminate food loss and waste (through public-private partnerships where possible) and support innovative behaviour change approaches to shift norms on consumer food waste.

To assess the attitudes and behaviours that determine food waste generation among households in West Asia, the UNEP regional office for West Asia conducted a cross-sectional qualitative study using a web-based questionnaire on a convenient sample of 200 participants from 10 countries in West Asia. The survey was conducted between July and November 2020 and completed by 200 participants. The study’s objective was to get a better understanding of the food waste issue, which is needed to tailor effective community-based interventions. Smell, taste and expiry date were reported as the main reasons leading to food disposal.



Food waste can be addressed by developing and implementing awareness campaigns aimed at encouraging people to first use those food items that are close to expiry, to perform a monthly inventory of their food stock to identify items near the expiry date and to prepare a shopping list before their supermarket visits. Awareness campaigns should also focus on addressing impulse buying, encouraging people to buy only what they need and not be tempted by special offers. Promoting food banks can be another strategy to encourage people to donate packaged foods that are near expiry before they spoil. Accordingly, retailers should be encouraged to develop partnerships with food banks to organize food donation processes, an approach that has been successful in some countries (e.g. France).

In light of the COVID-19 pandemic, food loss and waste increased due to lockdowns and restrictions on movement and transport. Around 33 per cent of the survey respondents reported that their food waste generation increased after the start of the pandemic. This can be attributed to several factors, including the exaggerated food shopping out of fears that some food items may disappear from retail shelves. While food waste generation at the hospitality level decreased due to pandemic-associated lockdowns, staying at home encouraged people to cook, resulting in overproduction of food and ending in wastage.

On another note, the share of respondents who said they used leftovers “regularly/frequently” increased between the pre-COVID (42.1 per cent) and post-COVID (49.7 per cent) periods. This trend may be due to lockdown restrictions modifying shopping habits and increased time spent at home, and/or due to heightened interest in healthy eating to boost immunity, as home-made foods are generally known to be better in this regard. This made people store leftovers for subsequent consumption instead of disposing of them.

In summary, one-third of the study respondents reported an increase in their food waste generation but simultaneously increased their use of food leftovers following the emergence of the COVID-19 pandemic. Due to the absence of quantitative studies on food waste generation in West Asia, comparing pre- and post-COVID-19 responses was not possible.

In the COVID-19 survey, 33.3 per cent of respondents reported that they threw away spoiled and moldy food, which is justifiable. Yet, they disposed of unopened packages past their expiry dates, highlighting the importance of buying only what is needed from food shops and keeping an eye on the food stock at home. The most frequently reported category of food waste generation was fruits, vegetables and salads (20.5%). This may be tackled by increasing awareness of the possibility to process such perishable products into juices, sauces and pastes for further use in cooking or processing.

Notably, most respondents agreed that wasting food makes them feel guilty about people who do not have enough food (87 per cent) and about the environment (84 per cent). Sixty nine 69.5 per cent agreed that they should reuse leftovers. This positive finding shows that people in West Asia are willing to change their behaviour regarding food waste. However, policies must be developed and implemented, awareness must be raised, and additional food banks and similar initiatives must be in place in order to translate this willingness into impactful action.

The COVID-19 pandemic has had negative effects on gender equality in the region. The closure of schools and day-care centres, disruption in employment and increase in teleworking has put family members who take care of meal preparation on the front line, adding to the already high levels of unpaid care and domestic work performed by women. Furthermore, the pandemic has resulted in severe disruption from job loss in the accommodation and food service sectors, where women tend to be overrepresented (United Nations Entity for Gender Equality and the Empowerment of Women [UN Women] 2020). Therefore, the analysis of food waste trends can also contribute to reflections on socioeconomic impacts and help designing gender-responsive food loss and waste reduction strategies

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# FRAMING THE ISSUE OF FOOD WASTE IN WEST ASIA

## 1.1 Challenges Facing Food Systems

Food systems comprise all actors and their value-adding activities in the food supply chain, from production and processing to distribution, consumption and disposal. Consequently, a sustainable food system provides food security and nutrition for all while conserving natural resources. Sustainable food systems are critical to alleviating poverty and play an important role in building resilience in a rapidly changing global environment (Food and Agriculture Organization of the United Nations [FAO] 2018a).

Food systems across the globe are under increasing pressure to address emerging challenges. These include increasing demands for larger quantity, quality and diversity of food; chronic worldwide hunger; obesity and related health conditions; food prices and their associated impacts on food security; climate and ecosystem change; and most importantly food loss and waste generation (United Nations Environment Programme [UNEP] 2020).

## 1.2 Introduction to Food Waste

West Asia comprises 12 countries with income disparities

Food loss and food waste are two of the largest ethical challenges facing humanity today, especially in a region that is highly dependent on food imports to meet its dietary needs. In recent years, governmental and non-governmental organizations have emphasized the impacts of the magnitude of lost or wasted food on food security, sustainability and the environment. Food loss and food waste create major ethical dilemmas as more than 820 million people globally continue to endure undernourishment (FAO 2011; FAO 2015a; Oelofse and Nahman 2013), as the demand for food intensifies worldwide (FAO 2014a).

Food loss is considered to occur from the farm up to (and excluding) the retail sector, and food waste occurs at the retail, food service and household levels. The FAO and UNEP (2016) describe “food loss” as a decrease in edible food in quantity or quality, occurring during the production and distribution segments of the food supply chain, which is due mainly to the performance of the food production and supply system or its institutional and legal framework. In contrast, these organizations define “food waste” as food that is fit for human consumption but has been removed from the food supply chain, either by choice or because it has spoiled or expired; this can be attributed to economic or

social behaviour, poor stock management, or neglect, usually at the retail or consumer levels (FAO 2011; FAO 2015a; UNEP 2016).

Together, food loss and food waste can be considered food supply chain losses, referring to each stage along the chain where a given proportion of food, initially

meant for consumption, does not reach the intended consumer (Fig. 1) (Parfitt, Barthel and Macnaughton 2010; FAO 2011; Kummu *et al.* 2012; Miller and Welch 2013; Richter and Bokelmann 2016; Willersinn *et al.* 2017).

**Fig. 1** Food loss and food waste along the supply chain



According to the FAO, around one-third of global food production – estimated at 1.3 billion tons of edible foodstuffs intended for human consumption is wasted every year along the supply chain from production to consumption. This quantity is enough to feed one-eighth of the global population, lifting them out of malnutrition and hunger. Moreover, this quantity is sufficient to mitigate the global challenge of meeting the increased demand for food, due to the growing world population.

The amount of food waste generated varies among countries. However, emerging research suggests that per capita food waste at the household level is more similar across income levels than was previously expected (UNEP 2021). In developing or low-income countries, around two-thirds of the food produced is lost post-harvest and during processing, which can be attributed to poor agricultural practices, technical limitations, financial and labour restrictions, and inadequate storage infrastructure processing and transport. In developed or medium- to high-income countries, a considerable fraction of wasted food is generated at the consumption level, driven primarily by consumers' values, behaviours and attitudes (Gustavsson *et al.* 2011; Bond *et al.* 2013).



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Food loss and food waste are a serious concern for nutritional insecurity as they reduce the availability of food intended for human consumption. In addition, food loss and waste have grave repercussions for the environment, the economy, natural resources and livelihoods (FAO 2011; UNEP 2020a; UNEP 2021). For instance, food can experience qualitative loss before reaching consumers, losing nutritional value and potentially becoming unsafe. Moreover, the most perishable foods tend to be the most micronutrient-dense. There is a strong link between reducing food loss and waste to preserve food quality and safety on the one hand, and healthy and diverse diets on the other.

When disposed into landfills, a substantial proportion of food waste is converted into methane, a greenhouse gas known for its global warming potential, 25 times

greater than that of carbon dioxide (CO<sub>2</sub>) (UNEP 2019a). If food loss and food waste were a country, it would be the world's third-largest emitter of greenhouse gases (FAO 2013a). Reducing food waste and food loss would reduce these emissions, estimated at around 1.5 gigatons of CO<sub>2</sub> equivalent every year, translating into 8 per cent of global greenhouse gas emissions (UNEP 2020b).



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Food loss and food waste represent squandered investment in agriculture, generating massive inefficiencies in the use of resources, including water, energy, land, fertilizers and labour (UNEP 2020a). National policies and initiatives tackling food loss and food waste are beneficial to those food producers and consumers who could potentially benefit from more affordable and healthy foods. Accordingly, reducing food loss and waste can lower food prices, particularly in favour of consumers (Rutten 2013a).

Similarly, efforts and programmes supported by policies or implemented by either governmental or non-governmental organizations aiming at reducing food loss and waste in developed countries might eventually contribute to lower food prices in developing countries (Rutten 2013a; Rutten 2013b), save resources and improve production efficiency along food supply chains (Buzby and Hyman 2012). Such changes are

believed to enhance accessibility to more nutritious foods, especially among vulnerable households, hence improving food security (FAO 2011; UNEP 2020a).

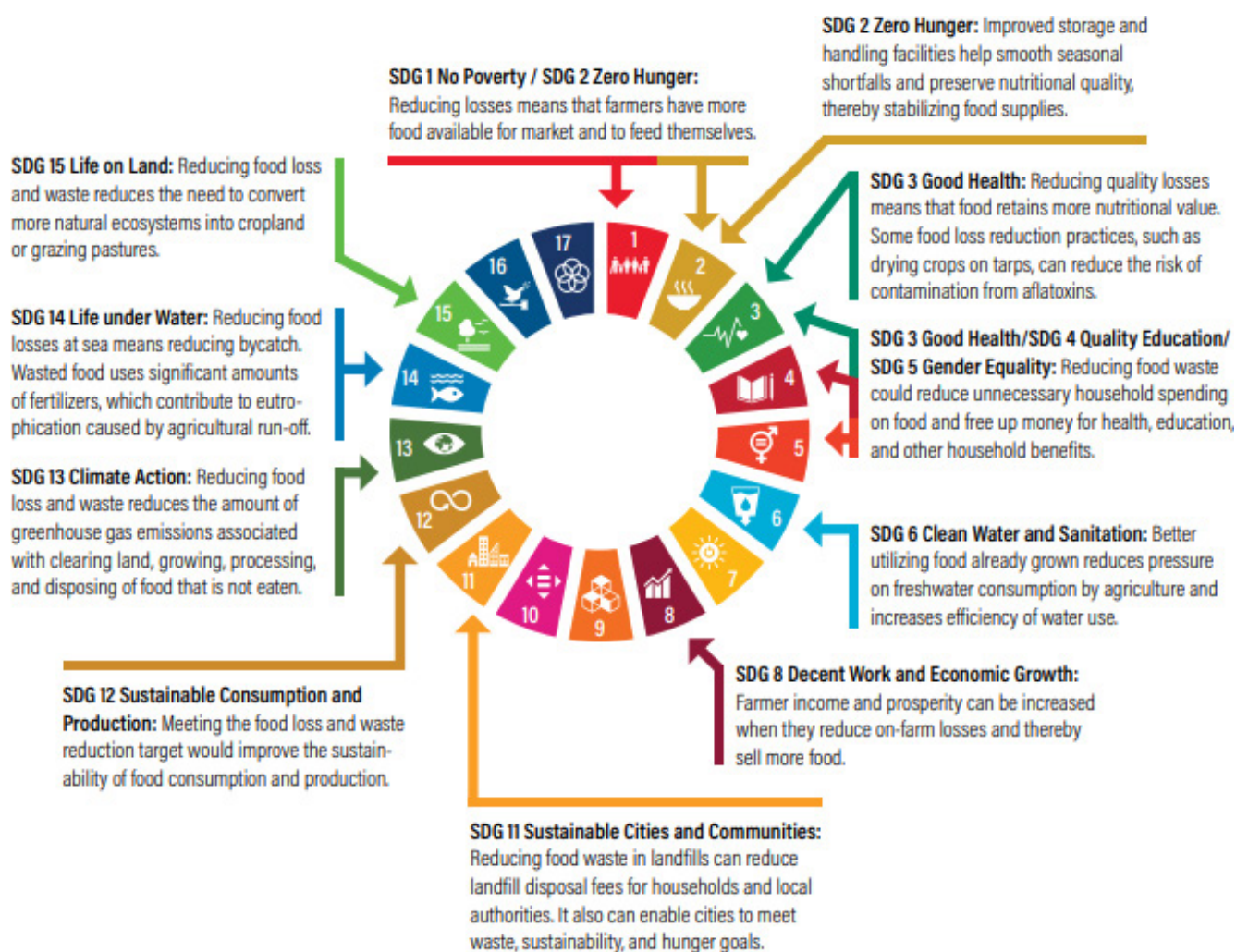


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In September 2015, the United Nations General Assembly approved a group of 17 Sustainable Development Goals (SDGs) as part of the 2030 Agenda for Sustainable Development. SDG 12 seeks to “ensure sustainable consumption and production patterns.” Under this goal, the third target (Target 12.3) calls for halving per capita global food waste generation at the retail and household levels and reducing food losses across the supply chain by 2030. Halving the quantity of food supply chain losses can help meet the nutritional needs of around 63 million undernourished individuals from developing and low-income regions (Munesue, Masui and Fushima 2015).

Knowing the considerable amounts of lost and wasted food annually, there is no doubt that curbing food loss and food waste (addressing SDG 12.3) could have a significant positive impact on efforts to address several SDGs, including ending poverty, reducing hunger, improving health, gender equality, education, access to clean water, contributing to sustainable cities and communities, enhancing economic growth, mitigating climate change and improving life on land and under water (Fig. 2) (UNEP 2020a).

**Fig. 2** Addressing SDG 12.3 and its associated effects on multiple SDGs



Accordingly, efforts have been focused on developing and implementing various innovative measures to mitigate food loss and food waste across the globe (Ruel and Alderman 2013). Approaches and solutions targeting food loss and waste along the supply chain have been explored in various regions worldwide at the pre-consumer level (i.e., the post-harvest, handling, storage and processing levels) in addition to the retail and consumer levels (FAO 2011). Other efforts have been exploring various ways to redirect or recycle food loss and waste, focusing on (a) waste-to-energy conversion (Ouda *et al.* 2016); (b) extraction and processing of high-value compounds and value-added products; and (c) production of organic compost (Lin *et al.* 2013).

The United Nations Environment Programme (UNEP) and other UN agencies have invested in various initiatives and efforts to mitigate food loss and waste worldwide. In addition, various initiatives introduced by the private sector target food loss and waste. Such initiatives encourage public and private sector collaboration and contribute to meeting or monitoring progress towards SDG 12.3. Furthermore, governments need to include food waste reduction as part of their Nationally Determined Contributions (NDCs) towards reducing greenhouse gas emissions under the Paris Agreement.

### 1.3 Food Waste in West Asia: An Overview

West Asia has unique regional features related to its diverse culture, religion, history, and climate, impacting food waste generation. The annual religious festivals, such as the Hajj and Ashura, attract immense numbers of pilgrims that contribute greatly to food waste generation over short periods.

Food loss in West Asia is estimated at roughly 44 per cent, and food waste is estimated at 34 per cent (FAO 2011). Such high levels are alarming, especially in a region that is highly dependent on food imports (FAO 2015b). Food loss and waste in West Asia are estimated to be around 31 per cent for cereals, 33 per cent for roots and tubers, 29 per cent for oilseeds and pulses, 56 per cent for fruits and vegetables, 23 per cent for meat and poultry, 30 per cent for fish and seafood, and 20 per cent for milk and dairy; this amounts to around 210 kilograms per capita per year, which is relatively high when compared with Europe and North America (FAO 2011; Abiad and Meho 2018).

Given West Asia's limited natural resources and increased dependency on food imports to meet nutritional needs, such levels of food waste are not

only uneconomical but, in fact, harmful to both the environment and the region's food security. Additionally, the current situation in some countries in the region, including Iraq, the Syrian Arab Republic, Palestine and Yemen, is aggravated by persistent instability and ongoing conflicts (FAO 2013b; FAO 2017a; FAO 2017b; FAO 2017c; FAO 2017d), resulting in increased poverty rates (World Bank 2017). Citizens of these Countries in Conflict can be offered better food security if the amount and mode of food wastage are appropriately documented and explained.



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### 1.4 Food Waste at the Household Level

Food consumption and wastage behaviours vary across cultures, necessitating their examination in different populations of various income levels. Factors affecting food waste generation at the household level include appearance and taste expectations, socioeconomic status, shopping attitudes, insufficient knowledge, errors in packaging, and health misconceptions about leftovers, as well as overall behaviours and beliefs (Aschemann-Witzel *et al.* 2015).

Significant reductions in household food waste will be required, alongside other sectors, to meet the ambitious goals of SDG 12.3 in addition to other targets related to food waste. Reducing household food waste is not straightforward, since the amount and types of food waste result from many household interactions. These factors include household size, living in an urban or rural area, and household members managing and

consuming food, alongside the amounts and types of food brought home, among others (Quested *et al.* 2013). The analysis of the household and intra-household dynamics plays a key role in understanding who makes decisions, also acknowledging the diversity of women and men as value chain actors with unique characteristics, abilities and needs (FAO 2018a). This allows tailoring and targeting interventions.

On the other hand, various activities such as meal planning, shopping lists, impulse purchases, food storage and leftovers management can greatly reduce food waste generated in households (Schanes *et al.* 2018). Nevertheless, these actions may be prompted by several factors, including social norms, knowledge, attitudes, intentions and lifestyle. In addition, food attributes such as shelf life, packaging and price can impact household food waste generation (Quested *et al.* 2013).

In West Asia, both data and understanding of household food waste generation remain scarce. A handful of studies have been conducted to gather information in this regard, exploring the determinants of household food waste generation. These studies are limited to Iraq, Kuwait, Lebanon, Palestine, Saudi Arabia and the United Arab Emirates (Abiad and Meho 2018).



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## 1.5 Food Waste in the Retail and Hotel/Restaurant/Catering Sectors

Food wastage exists at every stage of the food value chain due to mishandling and lack of coordination among the various activities along the chain, from harvest to transport, manufacturing, storage and distribution (FAO 2011).

At the retail level, the types of food retailing in West Asia vary from modern hyper- and supermarkets to mid-size shops and street markets (especially in Countries in Conflict). Modern hyper and supermarkets have quality standards in place and systems to manage inventories, while in mid-size shops and traditional street markets

products are not sorted, graded or packed and suffer significant damage from mishandling. Further significant causes of food waste include an oversupply of foodstuffs due to incorrect projections of food demand and efforts to meet customers' desires to see regularly full shelves (Monier et al. 2010; Stenmarck et al. 2011).

Another contributor to food waste at the retail level is the tendency of consumers to buy the freshest food products that are not near "expiration" or "best by" dates and to refrain from buying "imperfect" or "damaged"

products based on appearance. Improper handling and storage of food items in retail shops shorten shelf-life and subject food commodities to early and quick spoilage. In addition, errors in packaging and labelling, cross-contamination and adulteration contribute to food loss at the retail level (FAO 2011; Priefer, Jörissen and Bräutigam 2016).

On the other hand, food waste generation in the food service sector – hotels, restaurants, cafeterias, pubs and catering services as well as workplace canteens, hospitals, schools, prisons and retirement homes – is mainly a result of cooking practices, difficulties in anticipating demand and oversized standard portion sizes. In schools and hospitals, lack of autonomy over meal times, fixed portion sizes and lack of motivation to improve quality increase food waste (Priefer, Jörissen and Bräutigam 2013).



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Here below is a list of studies carried out that address the diverse challenges in the area:

- In the United Arab Emirates, a breakfast buffet was reported as the event generating the most food waste, followed by *a la carte* type service events. The show-up rate of guests at events and the number of dishes being served at the event had the most significant effect on the amount of food waste generated (Pirani and Arafat 2016).
- In Egypt, a study reported that the daily weight of food waste per guest per night ranged between 0.4 and 2.8 kilograms. Only two hotels (2 per cent of those studied) were found to be in the “excellent” category of the international standard benchmarks of waste production (Ball and Abou Taleb 2011).
- In Jordan, around 13 per cent of purchased food items at a university cafeteria were wasted. Less than 1 per cent of participants wasted their purchased rice, while around 2 per cent wasted their meat, and the wasted proportion of fruits was the lowest among all items (Al-Domi *et al.* 2011).
- In food outlets on a Qatari university campus, the root cause of excessive food waste generation was found to be overproduction rather than consumer wastage (Abdelaal, McKay and Mackey 2019). This points to the importance of awareness campaigns targeting both food providers as well as food consumers.
- In a study of hospitals in Saudi Arabia, food waste at one hospital was reported to be 24-32 per cent of the presented portions, which corresponds to 0.659-0.852 kilograms per patient per day (Al-shoshan 1992).

Addressing all of these various food waste channels can contribute to combating the food waste dilemma.

## 1.6 Impact of Food Waste on Food Security in the Region

Food wastage has severe implications for food security. The total amount of food waste generated worldwide every year is estimated to satisfy the need to feed more than four times the 800 million people who suffer from hunger (FAO 2013a). The social impact of food wastage is also linked to livelihood losses. Early on in the food supply chain, if food produced by a farmer becomes

degraded due to improper storage, weather conditions or pests, it may have to be sold at lower prices or even discarded, adversely affecting the farmer’s livelihood. Meanwhile, food wasted near the end of the supply chain can affect household nutrition and spending. Food wastage also decreases food availability on the

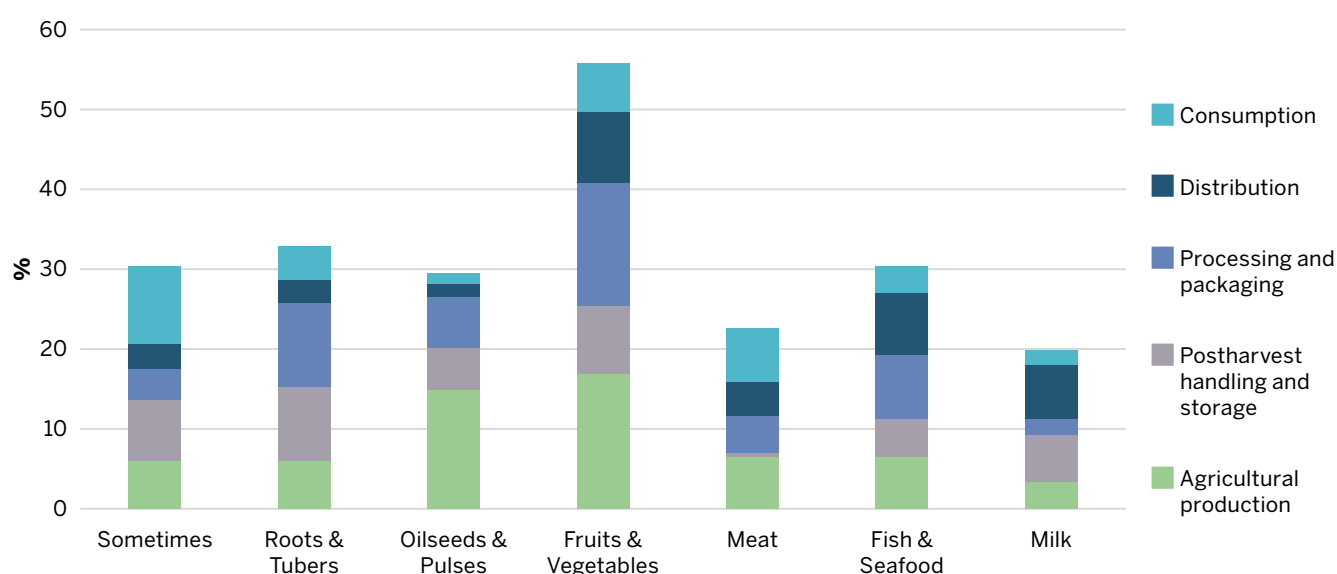


market, which may cause a rise in food prices and a decline in the capacity of low-income consumers to purchase food.

The most evident impact of food loss and waste on food security is a decline in food availability and access by those most vulnerable. This impact can be explained by either a reduction in food quantities or price hikes

leading to scarcity and unrest – thus disrupting further access and food supply. In West Asia, edible food waste at the distribution and consumption levels was highest for fruits and vegetables (around 15 per cent), followed by meat (around 10 per cent) and fish and seafood (around 10 per cent); meanwhile, oilseeds and pulses had less than 5 per cent edible food waste (FAO 2015b) (Fig. 3).

**Fig. 3** Share of edible food loss and waste (by weight) by commodity group in each step of the food supply chain for North Africa and West and Central Asia



Source: FAO 2015b

Furthermore, in particular contexts, and with the appropriate technologies and investments, part of the lost and wasted food can be reintegrated into the food supply chain, positively shaping food security. On the other hand, some other parts of food loss and waste are mostly unrecoverable and have minimal or no effect on food security. However, it should be noted that the association between food loss and food waste on one hand and food security on the other has not been sufficiently tackled.

For example, a policy-oriented report from the High-Level Panel of Experts on Food Security and Nutrition presents a synthesis of existing evidence about the causes of food loss and waste. It suggests action to reduce loss and waste to improve food and nutrition security and the sustainability of food systems (FAO

2014a). On the other hand, no clear policies, strategies, or programmes, including in West Asia, target food loss and waste reductions to improve or impact food security (Barret 2015). In most cases, such systems, strategies and programmes lead to other benefits, such as increased efficiency throughout the supply chain, improved productivity of resources and more savings, to name a few.

Typically, “grade A” (excellent condition) produce ends up on the shelves of high-end grocery stores and pay the bills for the entire crop, whereas “grade B” produce goes to food service establishments, food processing facilities, lower-end grocery stores and food banks. However, lower-grade produce may not be harvested at times and is often plowed under in the field because the price that farmers can get for it is lower than the

cost of harvest. To address this waste, new initiatives worldwide have targeted “ugly” produce by simply labeling grade B produce that is already being eaten, but not by upscale shoppers. Such efforts to reduce food waste are limited in West Asia, although in 2017 ugly produce found its way into supermarkets across

the United Arab Emirates through initiatives to address the food waste issue. Another example in the region is Negaderha, a project that aims to prevent and reduce food waste in households and across the hospitality industry (Box 1).

### **Box 1** Negaderha aims to prevent and reduce food waste in households and across the hospitality industry

Negaderha, a project by Savola World, a leading strategic investment holding group in the food and retail sectors across the Middle East and North Africa, aims to prevent and reduce food waste in households and across the hospitality industry. This project seeks to:

- Understand drivers, actors, and volumes of food waste at a national level;
- Set an action plan for change in food waste generation;
- Promote campaigns for food waste reduction, based on successful global experiences; and
- Create a framework to track food waste data and measure progress towards the final strategic objectives.

Negaderha’s initiatives in Saudi Arabia include, so far, an alliance with food non-governmental organizations, ongoing awareness community campaigns on food waste reduction and the distribution of 1 million food containers to reduce food waste in the hotel/restaurant/catering sector.

## **1.7 Impact of Food Waste on the Environment in the Region**

Just over half of food waste is estimated to occur during the “upstream” phase (production, yield handling and storage), while the other half happens during the “downstream” phase (processing, distribution and consumption). Unlike developing countries, middle- and higher-income regions showed greater food wastage during the downstream phase. The farther down the chain the food waste is generated, the greater its environmental impact, as the assessment must account for the energy and natural resources spent processing, transporting, storing and cooking the food that is later wasted.

Food waste dumped in landfills generates a large amount of methane, which can absorb infrared radiation and heat the earth’s atmosphere, contributing greatly to global warming and climate change. UNEP’s *Waste Management Outlook for West Asia* report estimated that more than half of the region’s municipal

solid waste is organic, responsible for annual methane emissions of around 65 gigagrams in 2020 – a figure that is expected to nearly double by 2040 (UNEP 2019b).

Agriculture accounts for 70 per cent of the world’s water use, and thus food waste represents an immense waste of water resources. Wasting one kilogram of beef alone results in 50,000 litres of wasted water, and wasting one glass of milk and one apple result in water waste of 1,000 litres and 70 litres, respectively (FAO 2013a). Efforts to reduce food loss and waste greatly impact West Asia’s water footprint. Each year, around 40 billion cubic metres (about around 90 cubic metres per capita) of water is wasted in the North Africa, Western Asia & Central Asia region due to food loss and waste (FAO 2013c). This environmental impact is a step backward in West Asia’s ability to meet its food needs.

## 1.8 Effect of COVID-19 on Food Waste

Due to the scarcity of quantitative studies on food waste worldwide, determining the actual effect of the COVID-19 pandemic on food waste generation is not possible. An initial and highly visible impact of the COVID-19 pandemic was fewer visits to hotels, restaurants and canteens, which decreased food waste generation at the food service level. However, immediately following the lockdowns, food items stored by these facilities, especially perishable items, might have left to degrade rather than being donated. This might have been the case in the cities where civil society organizations such as food banks are not operational (or are not properly operating during the Covid-19 pandemic). In addition, certain value chains supplying niche products to the hotel/restaurant/catering sector might have collapsed.

At the consumer level, empty grocery store shelves were evident in the early months of the pandemic due to panic buying from fear of food shortages. Because they were purchased in large quantities, panic-purchased foods might have wasted at higher rates than foods acquired normally, as they were not always of the preferred brand, size or formulation. More recently, online food ordering has become more evident. While this may temper impulse food purchases, it may also increase consumers' "psychological distance" to food, a phenomenon that has been shown to increase the tendency to waste food (Ilyuk 2018).

Furthermore, it is possible that the shift to at-home meal preparation and consumption during the pandemic has resulted in less plate waste but more waste during preparation and food management. For economic reasons, households may rely more on staple, non-perishable foods and less on fresh fruits and vegetables, meats, fish and dairy. The economic stress caused by the pandemic could have stimulated improvements in efficiency at the household level, resulting in less food waste. However, in terms of socioeconomic impacts, the pandemic stress may have generated gender inequality effects, putting more pressure on those family members (mainly women) that are on the front line of meal preparation.

Another result of the pandemic might have been related to the students returning home from schools and universities, which may have temporarily increased food waste as food items may have been left to spoil in student housing and canteens. Furthermore, it is expected that several weeks might be needed for the households absorbing the students to adjust appropriately, resulting in a greater chance of waste from overprovisioning or acquisition of items not favoured by those returning household members (Roe, Bender and Qi 2021).



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02

# ADDRESSING THE FOOD WASTE CHALLENGE: PUBLIC AND PRIVATE INTERVENTIONS ON FOOD WASTE MITIGATION IN WEST ASIA

## 2.1 Role of Non-governmental Organizations and Food Banks

Today, there is increased global awareness about the threats of sustainability to the food supply base. This acknowledgement has led non-governmental organizations to unleash numerous initiatives and efforts, such as “awareness campaigns” and “food banks” whose main objective is to mitigate food waste

by collecting unserved food and channelling it to needy people (Schneider 2013). Table 1 summarizes the efforts and ongoing projects in West Asian countries that focus mainly on reducing food waste or preventing edible food from being disposed into landfills.

**Table 1** Summary of existing efforts to mitigate food waste in West Asia

Country	Name	Organization type	Description/Goal
Bahrain	Bahrain Food Bank	Civil society	Aims to reduce food wastage through food donations and informative campaigns.
Bahrain	Food Preservation Association	Civil society	Aims to reduce food wastage by collecting food leftovers from hotels, restaurants and other social events and then donating them.
Jordan	Family Kitchen	Civil society	Collects food leftovers from hotels and gives them to the needy (active since 2009).
Kuwait	Kuwait Food Bank	Civil society	Aims to reduce food wastage through food donations and informative campaigns.
Kuwait	refoodkuwait	Civil society	Aims to eliminate food waste in the food and beverage industry of Kuwait by collecting excess food.
Lebanon	Active Advocacy of Communities for Tomorrow	Civil society	Aims to “Act for Food” and reduce food loss and waste by collecting and distributing unsold but consumable items to charities and people in need.
Lebanon	FoodBlessed	Civil society	Aims to reduce food waste by collecting excess edible food from various partners and donating it to people in need.
Lebanon	Lebanese Food Bank	Civil society	Aims to fight and overcome hunger by developing effective feeding programmes in parallel with development and awareness programmes to eliminate hunger.
Oman	Be’ah	Governmental entity	Collects data on food waste (Muscat Daily 2018).
Qatar	Maison de Sushi	Private sector (restaurant)	Charges customers \$1.40 per item of food left after the meal is finished to encourage them to order more responsibly.
Qatar	Safe-Q	Research project funded by a non-profit organization	Aimed to study and develop a typology for food waste causes, examine trends in food consumption, develop a holistic understanding of the food waste generated from the supply and demand perspectives and develop policy recommendations. Funded by the Qatar National Foundation Research Fund and completed in 2018.
Qatar	Wa’hab	Civil society	Aims to reduce food waste and eradicate hunger by partnering with charities to collect and donate excess food waste and reduce the negative environmental impact.

Country	Name	Organization type	Description/Goal
Saudi Arabia	Negaderha (Savola World)	Private sector	Raises societal awareness of food waste through excess food distributions and awareness campaigns, including: a partnership with WRAP (Waste and Resources Action Programme) to maximize its impact on food waste reduction and prevention; providing recipes for using still-edible foods; a food portion calculator based on the meal and number of persons; providing proper definitions of food labels; and tips on how to properly store food.
Saudi Arabia	Saudi Food Bank	Civil society	Aims to raise societal awareness of food waste through campaigns and excess food distributions.
Saudi Arabia	Saudi Grains Organization	Public sector	Targets food waste and food loss by: providing national measurements for food loss and food waste; establishing a food loss and waste baseline; and integrating efficient solutions for agriculture to reduce food loss.
United Arab Emirates	Address Downtown	Private sector (luxury hotel)	Distributes the hotel's food surplus to those in need across Dubai, in collaboration with UAE Food Bank.
United Arab Emirates	Coya Dubai	Private sector (global restaurant chain)	Coya Middle East's executive chef has encouraged staff to utilize purchased products to their full potential in innovative ways to minimize waste.
United Arab Emirates	Dubai Carbon Centre of Excellence	Private sector	Provides a Ramadan calculator for food footprint. Established by agreement between the UN Development Programme and Dubai Supreme Council of Energy.
United Arab Emirates	Dubai Municipality	Governmental entity	The municipality, particularly the Food Safety Department, works to reduce food spoilage and waste through recycling and food transfers to the UAE Food Bank. Between 2016 and 2017, they reduced food spoilage from 13 586 tons to 3 670 tons.
United Arab Emirates	FoodKarma	Private sector (mobile app)	Aims to reduce food wastage by enabling users to purchase food from FoodKarma's partners at a discounted price to save it from being thrown away.

Country	Name	Organization type	Description/Goal
United Arab Emirates	UAE Food Bank	Civil society	<p>Aims to reduce food waste for humanitarian, economic and environmental purposes, including by:</p> <ul style="list-style-type: none"> <li>collecting food waste unfit for human consumption and recycling it in the chemical and fertilizer industries and energy generation;</li> <li>promoting organic fertilizer created from surplus food, to reduce the pollution produced by chemical fertilizers;</li> <li>coordinating with various stakeholders in the hospitality and food industries; and</li> <li>donating edible surplus food to underprivileged people within and outside of the country.</li> </ul>
United Arab Emirates	UAE Food Waste Pledge Members (Winnow)	Private sector	<p>Offers a pledge where the hospitality sector, chefs and businesses can join in cutting down food waste that translates to national economic costs.</p> <p>Members of the pledge receive benefits such as logo promotion and invitations to events.</p> <p>Over 1 million meals were saved in 2018, and the aim was to save 3 million meals yearly by 2020.</p>
Global (strong presence in United Arab Emirates)	Winnow	Private sector (company)	<p>Incorporates artificial intelligence into the professional kitchen through technology that analyses data to identify wasted food items, thus helping users measure and reduce their waste through better purchasing and more accurate data.</p>
Regional (Near East and North Africa)	MED 3-R Project by the Association of Cities and Regions for Sustainable Resource Management	International network	<p>Uses technical and technological know-how, capacity-building and expertise to reinforce cross-border cooperation based on the involvement of public authorities, social and economic actors, and the local population to promote an efficient waste management system, including food waste.</p>
Gulf Cooperation Council	AlSerkal Group and Imdaad	Private sector	<p>Collaboration in 2016 where Imdaad (an integrated facilities, environment, and energy management provider) collected all the cooking fat, oil and grease waste produced by Alserkal Group's clients for recycling into reusable products, thus reducing food waste and supporting greener production measures.</p>

## 2.2 Role of Governments

With the adoption of the Sustainable Development Goals in 2015, all nations implicitly agreed to SDG 12.3, targeting food loss and food waste. However, because the SDGs have 169 targets, adoption of the SDGs en masse does not necessarily mean that all governments will give sufficient attention and focus to food loss and waste reduction.

In West Asia, the absence of data to set baselines for countries represents a considerable challenge to measuring progress on SDG 12.3. Explicitly articulated food loss and waste reduction targets associated with this Goal, and set by governments at the national or sub-national level, would signal such consideration and focus. However, only two countries in West Asia have committed to halving food loss and waste by 2030: Saudi Arabia and the United Arab Emirates. The United Arab Emirates committed in November 2018 to working towards SDG 12.3 but has not yet established a baseline for food loss and waste generated quantities. In contrast, Saudi Arabia developed its food loss and waste baseline in September 2020 with established goals to advance towards the SDG 12.3 targets (Government of the United Arab Emirates 2019).

Following the UN Climate Action Summit in 2019, national leaders worldwide included food loss and waste reduction among the ways to ratchet up their Nationally Determined Contributions under the Paris Agreement. Only 11 countries (Belize, Bhutan, Burkina Faso, Chad, Côte d'Ivoire, Egypt, Ethiopia, Ghana, Honduras, Maldives and Uganda) included food loss in their NDCs, yet none mentioned food waste.

Food loss and waste reduction is an example of “what’s good for the climate is good for the economy and people.” The World Resources Institute has called it a rare “triple-win” strategy of the kind sought under the Paris Agreement (WRI 2019). Food loss and waste reduction can save money for farmers, companies and households; it can result in more feeding with less pressure on water and land resources, as well as reduced greenhouse gas emissions generated across the life cycle of food that will never be eaten.

These benefits from food loss and waste reduction can be achieved by governments adopting the “Target, Measure, and Act” approach:

- **Target:** Setting targets insinuates ambition, and ambition motivates action. Governments should adopt explicit food loss and waste reduction targets aligned with SDG 12.3.
- **Measure:** The old proverb “what gets measured gets managed” applies to food loss and waste. Governments must measure food loss and waste, publish the results and monitor progress towards achieving the reduction target over time through measuring every five years at least.
- **Act:** Action is what eventually matters. Based on data collected from measurement, governments should develop and implement strategies to mitigate their food loss and waste. These strategies are country-specific depending on where their loss and waste occurs in the food supply chain (WRI 2019).

Several barriers exist to achieving SDG 12 in West Asia, which vary across countries and sectors. The major barrier is the lack of a fundamental, cross-cutting change in patterns of consumption and production. Few incentives are in place to encourage the private sector to shift to more sustainable systems and practices. Governments in the region give lower political priority to sustainable production and consumption measures, limiting their impact. Unfortunately, such measures are often perceived as an environmental management issue, despite their close link to economic development benefits.



Governments in the region have not invested much in developing and implementing educational and awareness campaigns on sustainable production and consumption. The lack of effort to develop such programmes further hampers progress on SDG 12. Campaigns need to target food and diets, waste, reuse and recycling. Diets in the region are increasingly unhealthy, resulting in obesity and diet-associated health problems (ESCWA and FAO 2017). Food loss and waste are also prevalent, driven mainly by deficient post-harvest practices (lack of extension programmes targeting farmers); inappropriate technologies for handling, transporting and processing food; and inadequate transport and other infrastructure (lack of government investment and infrastructure upgrade).

Overall, more research is needed to understand the causes and quantities of household food waste in West Asia. The only country in the region with a food waste

baseline, Saudi Arabia, offers evidence that household food waste in similar countries in West Asia may be high.



© Saudi Gazette

### 2.3 Case Studies from West Asia

In the Gulf region (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates), significant food waste is typically generated during social and religious occasions, especially during the holy month of Ramadan, the pilgrimage season and Ashura. During Ramadan, food waste is highest in Lebanon, the United Arab Emirates, Saudi Arabia and other Gulf Cooperation Council countries (FAO 2016). For example, during Ramadan, 30-50 per cent of the food prepared in Saudi Arabia is thrown away; these shares reach 25 per cent in Qatar and 40 per cent in the United Arab Emirates (Al-Fawaz 2015; Khaishgi 2015; Baldwin 2016). The increase in food waste during Ramadan is attributed to the preparation of extravagant meals that far exceed families' needs, and leftovers are thrown away (Zayat 2017). However, such acts do not conform to the teachings of Islam and other religions, where Muslims are asked to share excess food with the poor.

Food is frequently prepared on a large scale in West Asia, especially during social events such as weddings, births and deaths (this practice is mainly linked to culture); in many cases, these events turn into extravagant shows flaunting wealth and social status. For example, food wasted at an average wedding in Mecca, Saudi Arabia can be sufficient to feed 250 hungry people (Abiad and Meho 2018). The amount of food wasted in Mecca in 2016 could be enough to feed more than 1 million of the hungry. Mecca's municipal waste typically contains a high share of food waste (40 per cent minimum by weight). However, no comprehensive data exist on the amount of food waste generated during such occasions across West Asia, except for in Saudi Arabia.

Meanwhile, ensuring food security in Saudi Arabia remains a major challenge, especially in a water-scarce country that is highly dependent on imports. This challenge has been the main driver for the country not to further invest in boosting food production but rather to reduce inefficiency in the food system by quantifying food loss and waste and establishing a baseline to international standards (worldwide, 14 countries have Food Loss and Waste baselines). This field survey was the first of its kind, nationally and internationally, in terms of the number of food products surveyed, geographical scope, sample size and qualitative distribution of food supply chain sites. The study was led by the Saudi Grains Organization and the Ministry of Environment, Water and Agriculture in cooperation with Al-Imam Muhammad Bin Saud Islamic University (Saudi Grains Organization 2019).

Elsewhere in the region, the city of Karbala in Iraq, located about 100 kilometres southwest of Baghdad, is designated as a holy site by Shiite Muslims, and the wider Governorate (Muhafazat) had a resident population of over 1 million in 2010. Around 15 million Shiite Muslims visit the city each year to observe Ashura (the tenth day of the month of Muharram), the anniversary of Imam Husayn's death, generating around 4,500 tons per day of mainly food waste, or 300 grams per pilgrim per day. Up to 20 million pilgrims attend the second event, Arba'een, which takes place 40 days later and lasts from 15 to 20 days. Pilgrims usually attend on foot from Iraq and countries around the world. The massive scale of attendance puts a significant strain on the city's waste management services, which during regular periods collects just under 7,600 tons per day (Abdulredha *et al.* 2020).



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In a typical year, Karbala's around 840 hotels are fully occupied during these pilgrimage events. The waste is collected from additional containers placed in the streets during the events and taken to transfer stations, from which it is then transported to dumpsites. In 2014, the Arba'een event was estimated to generate more than 37,500 tons of waste, most of it food waste. More recently, nearly 58,300 tons was produced daily by up to 18 million pilgrims (Abdulredha *et al.* 2017), representing around 195 million pilgrim days.



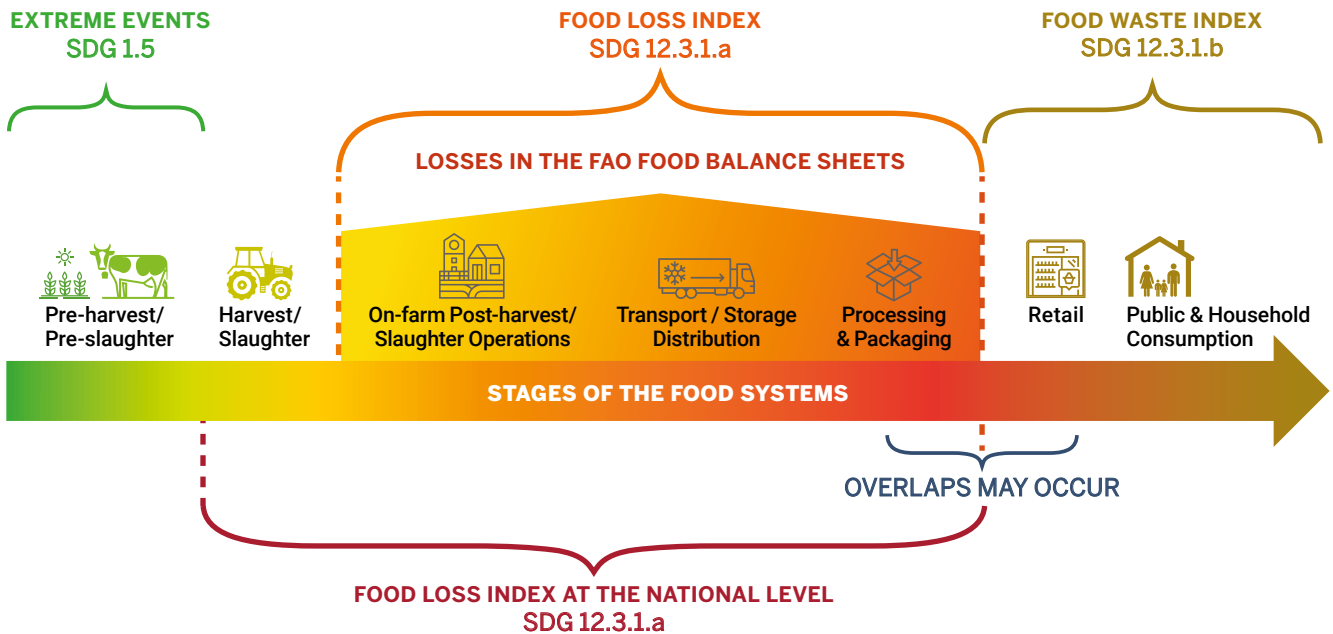
# 03

## SETTING TARGETS, DEVELOPING NATIONAL STRATEGIES AND IMPLEMENTING POLICIES TO DELIVER SDG 12.3 IN WEST ASIA

The challenge of food loss and waste has been incorporated into the 2030 Agenda for Sustainable Development, and its Sustainable Development Goals, under Goal 12, which aims to “ensure sustainable consumption and production patterns.” Specifically, SDG 12.3 calls for halving by 2030 “per capita global food waste at the retail and consumer levels, and

[reducing] food losses along production and supply chains, including post-harvest losses”. Food loss and waste are expected to be monitored through two indices, the Food Loss Index developed by the FAO, and the Food Waste Index developed by UNEP (Fig. 4).

**Fig. 4** Food Loss and Food Waste Indices



In West Asia, some policies might favour food loss and waste – such as the frequent use of across-the-board subsidies for food items in general and for staple items specifically. Moreover, significant gaps exist in institutional set-up and coordination, as food-related issues in the region are usually spread across various governmental departments, with sometimes conflicting interests and strategies (e.g., agriculture, commerce, industry, health, food safety institutions, etc.). In addition, the levels of investment in the food supply chain in West Asia are still inadequate, particularly those involving the private sector, where most food loss and waste occur (FAO 2014b; Barret 2015; Charbel et al. 2016).

Action is needed at multiple levels, and in various formats based on income level, to decrease food loss and waste. In low- and middle-income countries,

measures that will help address these challenges include improving food production and handling at the farm level, enhancing rural infrastructure to improve the efficiency of transport and handling, as well as tackling other structural inadequacies that might cripple the movement of food throughout the supply chain. In higher- and upper-middle-income economies, efforts should be targeted towards food operators, such as retailers and restaurants, encouraging them to adopt enhanced behavioural practices and sustained investments in the modernization of the food supply chain. For example, this would include eliminating or reducing unnecessary subsidies that may promote excessive spending and overconsumption. However, these efforts cannot be effective unless they are based on collected data, which can be achieved using the Food Loss and Waste Protocol and Standard.

### 3.1 Food Loss and Waste Protocol and Standard

The Food Loss and Waste Protocol and Standard is a multi-stakeholder effort to develop guidance that facilitates the quantification of food loss and waste for countries, companies and other organizations while encouraging consistency and transparency of the collected data. This protocol is assembled by the World

Resources Institute and involves several partners, including UNEP, the FAO, the World Business Council for Sustainable Development, the Consumer Goods Forum, the European Union (EU) project FUSIONS and the Waste and Resources Action Programme (WRAP).

Using the Food Loss and Waste Standard enables stakeholders to develop inventories of food loss and waste generated and where it ends up. These inventories, under this protocol, can underpin, inform and focus strategies for mitigating food loss and waste.

Additionally, the Food Loss and Waste Standard enables consistent quantification of food loss and waste, which can be particularly useful to the private sector for developing mechanisms to track food loss and waste. The standard is designed to exhibit practical data and resource controls and the possible reasons for quantifying food loss and waste. While the standard is firm in defining the scope of a Food Loss and Waste inventory and accounting and reporting requirements,

it is somehow flexible in the scope selection for this inventory. For example, users may choose whether they quantify both food and associated inedible parts removed from the food supply chain, or each individually.



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### 3.2 Food Waste Index to Measure and Report on SDG 12.3

The Food Waste Index, developed by UNEP as custodian of the food waste indicator for SDG 12.3, enables countries to measure food waste consistently and to report their progress towards 2030. The Index has three levels, increasing in accuracy and usefulness of data, but also increasing in the resources required to undertake them:

- **Level 1** uses modelling to estimate food waste for member states that have not yet undertaken their own measurement. It involves extrapolating data from other countries to estimate food waste in each sector for a given country. The estimates for these countries are approximate: they are sufficient to provide insight into the problem's scale and to make an action case, but inadequate to track food waste changes over time. They are intended as short-term support while governments develop a national measurement capacity (consistent with Level 2). UNEP has calculated Level 1 estimates on behalf of countries.
- **Level 2** is the recommended approach for countries. It involves the measurement of food waste. The nature of the measurement will vary according to sector and

circumstance. It will either be undertaken by national governments or derived from other national studies undertaken in line with the framework described below. Level 2 generates primary data on actual food waste generation and fulfills the requirement for tracking food waste at a national level, in line with SDG 12.3 targets.

- **Level 3** provides additional information to inform policy and other interventions designed to reduce food waste generation. This includes the disaggregation of data by destination, edible/inedible parts, gender and reporting of additional destinations such as sewer, home composting and (non-waste) animal feed.

For determining household waste volumes in Levels 2 and 3, the recommended methodologies include waste compositional analysis, direct measurement, diaries and mass balance. Methods proposed for assessing retail waste in Levels 2 and 3 include waste compositional analysis, direct measurement, counting/scanning, mass balance, and interviews and surveys to collate data.

### 3.3 Using the Food Loss Index to Measure and Report on SDG 12.3

One of the key inputs needed in the decision-making process to reduce food loss is the need for better data to drive innovation, encourage best practices and optimize the use of resources. Currently, only 4.4 per cent of food loss data are reported at the national level, by a handful of countries. However, mitigating food loss while objectively measuring it is a global priority to tackle this dilemma.

To increase the information base for food loss measuring and consequent SDG monitoring, the FAO has produced country guidelines to estimate food losses along the supply chain. Additionally, the FAO has developed a model that incorporates explanatory variables based on literature to explain losses, which will add value for countries seeking to decrease losses and focus on factors that make the greatest

impacts. The FAO also developed a set of guidelines for creating food loss sample surveys, including sampling methodology and measurement and an online e-learning course.

Accordingly, the Food Loss Index measures the changes in percentage losses for a basket of 10 main commodities by country compared to a base period, where food loss is measured along the food supply chain before consumption – that is, between harvest and retail. Consequently, this index can help develop well-informed policies and activities that will mitigate food losses along the food supply chain (UN 2016; FAO 2018b). Note that the Food Loss Index covers losses on the farm, during transport, in storage and during processing; food waste at the retail and household levels is covered by the Food Waste Index.

### 3.4 Measuring Food Waste in West Asia

Many countries, cities, companies and other entities lack sufficient understanding of the amount of food (and/or associated edible parts) that is removed from the food supply chain, as well as the reasons behind this removal and where along the chain it occurs. This makes it difficult to develop strategies, to prioritize actions to prevent food loss and food waste, and to identify ways to mitigate and use them. Moreover, what is considered “food loss and waste” varies widely. Without a reliable set of definitions or an accounting and reporting framework, it is challenging to compare data within or among entities over time and draw useful conclusions. As a result, the Food Waste Index was developed to compare the various entities.

The old proverb, “what gets measured gets managed,” holds true in the case of both food loss and food waste. Measuring loss and waste within national or regional borders or throughout the various sections of the food supply chain can help policymakers and decision makers better understand how much, where and why food is being lost or wasted. This information is the basis for developing and implementing reduction strategies. Moreover, measurement is necessary for governments to assess whether they are on track to meet SDG 12.3. A baseline is essential to monitor

changes in food loss and food waste generation over time. Unfortunately, in West Asia, only 1 out of the 12 countries (Saudi Arabia) has invested effort to establish a baseline for food waste generation. In 2021, UNEP will develop a Regional Food Waste Working Group in West Asia to build measurement capacity among governments.

In 2019, the Saudi Grains Organization (SAGO) and the Saudi Ministry of Environment, Water and Agriculture conducted an initial base-year assessment of food loss and waste in the Kingdom. The initiative included four stages (screening, awareness, leftover recycling, and making use of it), comprising a national observatory on food loss and waste. In total, 52,720 samples from 19 food commodities in 8 categories (flour/bread, rice, dates, fruits, vegetables, red meat, chicken and fish) were included in the study, which took two years to carry out and involved more than 600 researchers in 13 geographic areas.

The Saudi assessment discovered food loss and waste levels of around 33 per cent throughout the food supply chain, with food loss estimated at 14.2 per cent and food waste estimated at 18.9 per cent. Roughly 21 per cent of this total food loss and waste occurs during

the production stage, and 57 per cent during the consumption stage. Top food items lost and wasted were rice (at 31 per cent) and watermelon (at 32 per cent) (SAGO forthcoming).

Another national study is being carried out in Bahrain, and a few sub-national studies are being conducted in Iraq and Lebanon (Table 2), as reported by the *Food Waste Index Report 2021* (UNEP 2021, pp. 43-44).

The Bahrain study is based on a waste composition analysis; the food waste data from Bahrain have been classified as “medium confidence” (UNEP 2021, pp. 43-44), although this could be revised in the future with more methodological information. The studies from Iraq and Lebanon come from food waste diaries, while additional studies in Iraq (Yasir and Abudi 2009; Sulaymon, Ibraheem and Graimed 2010) involve direct measurement through weighing of household waste.

**Table 2** Studies in West Asia reporting food waste estimates at the household level

Country name	Study area	Household food waste estimate (kg/capita)	Reference
Bahrain	Nationwide	132	Alayam 2018
Iraq	Baghdad	75	Al-Maliky and ElKhayat 2012
	Mosul	85	Al-Rawi and Al-Tayyar 2013
	Karbala	142	Al-Mas'udi and Al-Haydari 2015
	Al-Kut City	138	Sulaymon, Ibraheem and Graimed 2010
	Nassiriya	163	Yasir and Abudi 2009
Lebanon	Beirut	105	Chalakh <i>et al.</i> 2019
Saudi Arabia	Nationwide	105	SAGO 2019

Source: UNEP 2021, pp. 43-44.

### 3.5 Initiatives to Mitigate Food Waste in West Asia

The various existing initiatives to mitigate food waste both worldwide and in West Asia include awareness campaigns, policies and legislation, and legally non-binding governmental and non-governmental initiatives.

#### Awareness campaigns

Harnessing knowledge and education can be an effective way of influencing and changing individual behaviour in such a way as to reduce food waste. In this context, awareness campaigns emphasizing the problematic nature of food waste and highlighting potential management solutions have greatly affected consumers' improvident behaviour (Lipinski *et al.* 2013). The gender consideration may play a major role to maximize the impact of the campaigns.

Examples of campaigns worldwide to encourage action against food waste include the following:

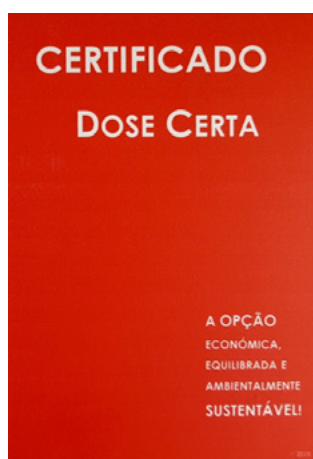
- In January 2013, UNEP, the FAO and partners launched Think.Eat.Save: Reduce Your Footprint in support of the FAO initiative SAVE FOOD and the UN Secretary General’s Zero Hunger Challenge (UNEP 2013).



© UNEP



- In Portugal, the waste management company LIPOR initiated Menu Dose Certa (“The Right Size”) to raise awareness about meal portion sizes and to encourage restaurants to serve balanced quantities proportionate to what customers can eat. The project aims to reduce restaurants’ food waste by 48.5 kilograms per customer (FAO 2013a; Priefer, Jörissen and Bräutigam 2013). Restaurants that met the specified criteria would receive the campaign’s seal (Priefer, Jörissen and Bräutigam 2013).



© LIPOR and Portuguese Association of Nutrition

- In Brazil, the #NOVOPF (“Rethink the Size of Your Order”) campaign from Akatu Institute, works with restaurant owners and customers to encourage restaurants to create small, medium and large options for the PF (Prato feito), a typical everyday

meal comprising rice, beans, salad and protein. The PF is usually a very big and relatively cheap meal, leading to a lot of waste. Through the campaign, customers can choose the size that’s right for their appetite (see <https://akatu.org.br/novopf>).

- In the United States, Green Muslims offers a campaign for a “Zero Waste Iftar” (which they call a “Leftar”) to raise awareness about waste prevention, including food waste (see <https://www.greenmuslims.org/ramadan>).
- Poubelle.org was a Belgian initiative to raise awareness of food waste through the use of humour. The site’s motto is “I buy a product, I buy its waste” and thus provides the public with information about waste generation, including food waste and solutions for sustainable consumption patterns (Authority of the House of Lords 2014).
- The Danish campaign Stop Spild Af Mad (“Stop Wasting Food”), launched in 2008, tackles food waste mitigation by reaching out to children, consumers, communities and government agencies (Priefer, Jörissen and Bräutigam 2013).
- Love Food Hate Waste is the leading global example of an effective food waste prevention campaign, and provides another example of the role of education in reducing wasted edible food. The campaign, first developed in the United Kingdom, has since been licensed to several other countries. Love Food Hate Waste provides grant funding to local government and community organizations to help them deliver education projects tailored for reducing food waste. Through social media and community engagement, the campaign provides tips, advice and other practical resources that help businesses and households reduce their food waste (Mason *et al.* 2011).



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## Policies and legislation

Policies and regulations could be used for the basis of the development of voluntary or compulsory approaches to reduce and/or prevent food wastage. Such policies and/or regulations need to be holistic to be effective – that is, they need to engage all stakeholders along the food value chain and be acceptable and easy to implement (FAO 2013a). Acknowledging the scale and repercussions of the problems associated with food waste, some governments have attempted to address them by developing and adopting policies and legislation targeting not just waste reduction but also waste recycling. Similarly, governments have developed time-framed food waste reduction targets while raising awareness among stakeholders and directing their efforts towards developing and monitoring national and regional waste reduction strategies. The adoption of defined targets, strategies and waste management plans that go above and beyond simply having waste and food waste-related legislation is essential for successful policy implementation.

In 2009, food waste legislation in Ireland made the segregation of food waste compulsory for businesses; businesses also are prohibited from disposing of food waste in the residual waste collection service and must instead use a specialized bin service that charges on a weight basis (FAO 2013a). Similarly, in Scotland, the Ministry of Environment issued waste regulations in 2012 (implemented in 2014), stipulating, among others, that food businesses segregate food waste from other recyclables. These regulations ban the incineration of food waste and, by 2021, divert these organic wastes away from landfills (FAO 2013a). In February 2016, France became the first country to prohibit supermarkets from throwing away unused food through unanimously passed legislation. Supermarkets of a certain size are obliged to partner with a food bank or rescue operation to develop a food donation process for unconsumed food, or they will be fined (Hinckley 2018).



© Foerster

Legal actions can also facilitate the process of donating food, as is the case in Belgium and other EU countries, especially when foodstuffs approach their “best before” date (O’Connor et al. 2014). Accordingly, a range of fiscal tools is successfully used to save edible food from being wasted. These initiatives include the abandonment of value-added tax (VAT) liability and the use of corporate tax credits for donated food. Although one option is to consider the value of donated food as fairly low or zero for tax purposes, this may negatively impact the Member States that offer a (percentage) corporate tax credit to companies on the value of the food they donate, nullifying the value of that tax credit. It is suggested that “abandoning” the VAT on donated food, rather than valuing donated food at zero, may be a more effective incentive, given its compatibility with other (potentially more significant) fiscal incentives such as tax credits, which appear to be the most effective incentive for food donation (O’Connor et al. 2014).

The Policy Document on Sustainable Food prepared by the Dutch Ministry of Agriculture, Nature and Food Quality in 2008 set a food waste reduction target of 20 per cent throughout the food chain, to be met by 2015 (Dutch Ministry of Agriculture 2008). The document prioritizes sustainable practices such as recycling and composting and conversion into animal feed or energy (Dutch Ministry of Agriculture 2008; FAO 2013a).

Several West Asian countries have set legislation, policies and national guidelines, as well as action plans, to tackle food loss and waste. Examples of such measures are presented in Table 3.

**Table 3** Examples of food loss and waste legislation in West Asia

Country	Legislation (and Department)	Details
<b>Iraq</b>	National Solid Waste Management Plan (Ministry of Environment)	It focuses on policy development and integrated planning regarding regulatory framework, economic aspects, institutional capacity, citizen and technical education, and technical and operational development.
<b>Jordan</b>	Environmental Protection Law (Ministry of Environment)	Among others, clarifies jurisdictions for waste management among government institutions.
	National Agenda for Solid Waste Utilization	Promotes waste management, identifies sound disposal sites, and encourages recycling and minimization of solid waste generation.
<b>Oman</b>	Conservation of the environment and prevention of pollution (Ministry of Environment)	This decree is the principal legal framework for environmental protection in the Sultanate of Oman.
	Regulations for the management of solid non-hazardous waste	This Regulation is composed of 19 articles referring to all the waste management stages.
<b>Palestine</b>	Environmental law (Palestinian National Authority)	It is the principal legal framework for environmental protection in Palestine.
	National Environmental Action Plan National Food and Nutrition Security Policy (Palestinian National Authority)	Sets actions and projects to solve or alleviate environmental problems, including solid waste and food waste.
	National Strategy for Solid Waste Management (Ministerial Cabinet)	A reference point for all decisions, programmes, activities and investment plans to develop the solid waste sector.

Country	Legislation (and Department)	Details
Qatar	Qatar National Development Strategy (Ministry of Municipality and Environment)	Includes a strategy to contain levels of waste generated and to promote recycling.
	Solid waste management plan	Reduces household waste, including food.
	Qatar National Vision 2030	Links food and nutrition security to environmental and economic development.
	National dietary guidelines (Supreme Council of Health)	Principles of food sustainability, environmental sustainability, food security, population and food waste.
Saudi Arabia	Environmental Standards on Material Recovery and Recycling (Ministry of Municipal and Rural Affairs, Presidency of Meteorology and Environment)	Best environmental practices, including waste recovery and recycling.
Lebanon	Food Waste Law (Lebanese Parliament)	Regulates donation of leftovers and surplus to charities.
United Arab Emirates	National Committee on Food Loss and Waste Reduction	Implements initiatives to reduce food loss and waste, including drawing up federal legislation for food loss and food waste, developing a unified electronic system for food loss and waste, and launching a national strategic indicator for this area. The action plan will see the issuance of a manual of practice for food loss and waste control procedures, update food standards, and enhance awareness of the impact of food loss and waste on food security in educational curricula.

### Non-binding governmental and non-governmental initiatives

In addition to the legally binding policies and directives, both governmental and non-governmental organizations and authorities in developed and developing economies have launched various initiatives to mitigate food waste generation in the hotel/restaurant/catering and retail/wholesale sectors. However, these initiatives are legally non-binding in nature.

### Governmental initiatives

Many governments in the developed world have encouraged and developed voluntary programmes to control and mitigate food waste. Examples include the following:

- In 2008, the National Waste Prevention Programme, a part of the Irish Environmental Protection Agency, launched the Green Hospitality Award targeting the hotel and catering sectors. This programme aimed to develop environmental best practices for the hospitality industry by setting measurement techniques and targets for waste reduction with a specific focus on food waste, while acknowledging top performers in the sector (European Commission 2015).
- Guardians of Grub, a campaign launched in the United Kingdom in 2019, is aimed at empowering professionals from across the hospitality and food service sector to reduce the amount of food thrown away in their establishments. It is about making simple, low-cost changes to the way food is bought, prepared and served to help reduce the amount of food needlessly thrown away.
- In Norway, the ForMat project is the most significant initiative to address food waste in the retail sector and from other stakeholders in the food value chain (Stensgård and Hanssen 2012). The project, launched in 2009 and financed by the Norwegian ministries of the environment and agriculture, is a cooperative effort among the government, retailers, producers and research institutions to quantify and minimize food waste in Norway (Authority of the House of Lords 2014).

Many governmental authorities also issue guidelines to help businesses adopt efficient measures to reduce food waste generation. Examples include Belgium’s good practice guide for restaurants (Marthinsen *et al.* 2012) and Ireland’s 2010 *Less Food Waste More Profit* guide that assists catering facilities in reducing food waste generation through better food management (FAO 2013a). Other guidelines include the United Kingdom’s 2011 revised guidance on the application of food-related date labelling, which aims to clarify consumer misunderstandings of the meaning and safety implications of different date labels, as well

as help businesses and retailers remove “sell by” and “display until” labels to avoid confusion, and to stop selling food after the “use by” and not the “best before” date (Lipinski *et al.* 2013). In the EU, a 2018 study estimated that up to 10 per cent of the 88 million tons of food waste generated annually in the region is linked to date marking (European Commission 2018). Accordingly, the EU date marking guidance is expected to be finalized by 2021 to mitigate food waste at the retail and consumer levels.

Several governmental campaigns related to food waste also exist in West Asia. In the United Arab Emirates, where around 3 million tons of food is wasted every year (estimated at \$4 billion), Dubai Municipality has urged the hospitality industry and residents to implement zero tolerance on food waste. The campaign is part of a series of municipal initiatives, including asking food establishments to present innovative ideas, tools and methodologies to identify food losses, their causes and potential solutions. In 2017, as part of efforts to shift 75 per cent of the municipality’s waste from landfills, Dubai signed a Memorandum of Understanding with Winnow, a UK company, to encourage technology for tackling food waste across the hospitality sector. The start-up provides smart meters in hotels that help kitchens cut food waste by automatically measuring the food discarded. On average, hotel kitchens in Dubai typically waste up to 20 per cent of the food purchased – a share that is observed to double during the holy month of Ramadan due to the recurring lavish Iftar and Suhoor buffet.



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Also in the United Arab Emirates, the I'M PERFECT campaign, launched by the Ministry of Climate Change and Environment with support from the FAO, clearly recognizes the problem of food waste. The campaign encourages the use of imperfect fruits and vegetables to reduce food waste and increase food surplus. The campaign highlights the importance of food safety (irrespective of imperfectly shaped produce), local production sustainability and waste management hierarchy (from waste reduction to reuse, segregation, and recycling). Another national initiative, Food Forward UAE, targets excess food from households and social events by encouraging its channelling to people in need.



© FAO (source: <http://www.fao.org/save-food/news-and-multimedia/news/news-details/en/c/427630>)

In Qatar, the sustainability advocacy group EcoMENA estimates that about half of the waste sitting in the country's landfills is leftover food; to address this challenge, the Ministry of Municipality and the Environment has designed food waste reduction initiatives to create societal awareness. In Saudi Arabia, Saudi Grains Organization has provided training to private sector stakeholders on best practices to reduce

food waste and prepared a legislative framework to implement rules regarding wastage. In addition, it launched activities to strengthen collaboration among supply chain stakeholders to improve product reuse. Other efforts are ongoing in Oman and Saudi Arabia to reduce losses and waste in the fish supply chain, where stakeholders are receiving training on improved product handling. The governments are also investing in enhancing the cold chain both for storage and transport.

### Non-governmental initiatives: international experiences

In the United Kingdom, members of the Food and Drink Federation committed in 2010 to meet individual targets for food reduction and to monitor their generation of waste and divert it from landfills. The final goal was to eliminate food waste sent to landfills by 2015 (FAO 2013a).

A newer UK initiative is Courtauld 2025, a voluntary agreement bringing together organizations across the food system to make food and drink production and consumption more sustainable. At its heart is a 10-year commitment to identify priorities, develop solutions and implement changes to cut the carbon, water and waste associated with food and drink by at least one-fifth over the decade. Two of the country's largest retail stores adopted individual initiatives related to total diversion of food waste from landfills through food donations, composting and recycling (FAO 2013a). Marks & Spencer achieved a 20 per cent drop in its food waste in 2009 compared to the previous year by offering price discounts on products with a short shelf life (FAO 2013a). In addition, Tesco slashed the amount of food going to waste from its operations by nearly a fifth after introducing new measures to distribute the surplus to staff and charity groups. The UK's biggest retailer announced that 44,297 tons of food went to waste in 2018/19, a fall of 17% compared to 2017/18, with the figure amounting to 0.45% of its sales. Furthermore, the supermarket reported an 82% increase in the amount of surplus food redistributed to charities, community groups, colleagues, and animal feed compared to 2017/18.

The leading Finnish private canteen operator, Faser Food Services, launched and adopted in 2011 a “Key Performance Indicator” system to track its canteen and restaurant operations. Weekly feedback on waste generation is also included, where a traffic light system designates whether the waste level is tolerable or not (Marthinsen *et al.* 2012).

In Italy, the COOP Group launched the project Buon Fine o Brutti ma Buoni to recover food products that were not sold due to packaging defects or nearing expiry dates, and to donate them to associations and non-profit organizations. In 2010, the project redistributed more than 2,990 tons of food (Rutten *et al.* 2013). Retail sector players in Denmark, in an attempt to lengthen the shelf life of food in stores, made a general agreement to the effect that the biggest suppliers of bread, beverages, etc. should deliver products immediately to stores instead of to company warehouses from where food is generally distributed (Stenmarck *et al.* 2011).

### **Fiscal and economic measures**

Landfill and incineration taxes present market-based solutions for shifting waste away from landfills and incineration and promoting more sustainable waste disposal practices, such as separation at source and recycling. The environmental costs of landfilling and incinerating food waste are embedded in the value of the taxes, which are generally incurred by any company, household, local authority and other waste generators in exchange for adopting such disposal methods. Most commonly, landfill site operators are liable for paying landfill taxes. However, they will pass the costs on to businesses and local councils on top of normal landfill fees. When waste incineration is practiced in a country, but no incineration tax is imposed, recycling efforts decrease since authorities are obliged to provide determined and guaranteed waste quantities to incineration operators (Ares and Bolton 2002).

In an attempt to overcome the economic barriers to food donation, many governments and local authorities have introduced tax credits and deductions and VAT exemptions to incentivize donors to redistribute food surplus instead of discarding it. In France, food donors can deduct 60 per cent of the value of donated food from their corporate income tax, and in Spain, 35 per cent of the value can be claimed as a corporate tax credit (O'Connor, Gheoldus and Jan 2014).

Other countries treat food donations as a deductible tax expense that can reduce the taxable income subject to certain limits and thresholds. In Germany, donations in the form of cash or in-kind (donated food by supermarkets) are tax-deductible expenses, on the condition that the deduction does not surpass 20 per cent of the company's income (O'Connor, Gheoldus and Jan 2014). Portugal, meanwhile, has an elaborate tax deduction scheme that enables donors to subtract 140 per cent of the value of the food at the time of donation, given that the donated food is used for social purposes (e.g., supplying food banks) and limited to 8/1000 of the donor's turnover (O'Connor, Gheoldus and Jan 2014). Some countries like Australia, Canada, Japan and Spain still impose VAT rates on donated food, whereas others like France, Germany, Hungary and Italy abandon VAT liability on food donated to food banks and charities if certain conditions are fulfilled (O'Connor, Gheoldus and Jan 2014).



## 04

# PERCEPTIONS OF FOOD WASTE GENERATION IN WEST ASIA: A CROSS-SECTIONAL STUDY

Food consumption and wastage behaviours vary across cultures. This warrants investigations across all countries and locations, taking into consideration different socioeconomic levels. To date, information about attitudes and behaviours governing food waste generation in West Asia is scarce. A key goal of this study was to assess the attitudes and behaviours that determine food waste in the region, to better understand and tailor community-based interventions. To assess people's food waste perceptions, a

web-based questionnaire was developed in both Arabic and English. A convenient sample of 200 participants from 10 countries in West Asia was requested to complete an online survey between July and November 2020. The selection of the participants was based on a list of socio-economic criteria, such as educational level, household income, household size, to come up with a diversified panel. The sample characteristics are summarized in Table 4, and selected survey results are discussed in the section that follows.

**Table 4** Characteristics of the surveyed participants

Independent variable		Number of participants	Share of total (%)
<b>Gender</b>	Male	86	43.0
	Female	114	57.0
<b>Country</b>	Bahrain	8	4.2
	Iraq	16	8.4
	Jordan	17	8.9
	Lebanon	26	13.7
	Kuwait	20	10.5
	Oman	10	5.3
	Palestine	13	6.8
	Saudi Arabia	34	17.9
	Syrian Arab Republic	35	18.4
	United Arab Emirates	21	11.1
<b>Educational level</b>	High school / Technical school	15	7.8
	Some college but no degree	20	10.4
	Bachelor degree or equivalent	81	42.0
	Postgraduate (MSc - PhD)	77	39.9
<b>Monthly household income</b>	Less than \$500	47	24.5
	\$501 to \$1 500	39	20.3
	\$1 501 to \$3 000	26	13.5
	\$3 001 to \$5 000	25	13.0
	\$5 001 and above	33	17.2
	Refuse to answer	30	15.6
<b>Household size (number of people living in the household, including domestic helpers)</b>	1 to 2	26	13.5
	3 to 4	73	37.8
	5 to 6	70	36.3
	7 to 8	19	9.8
	9 or above	5	2.6





## Selected Survey Results

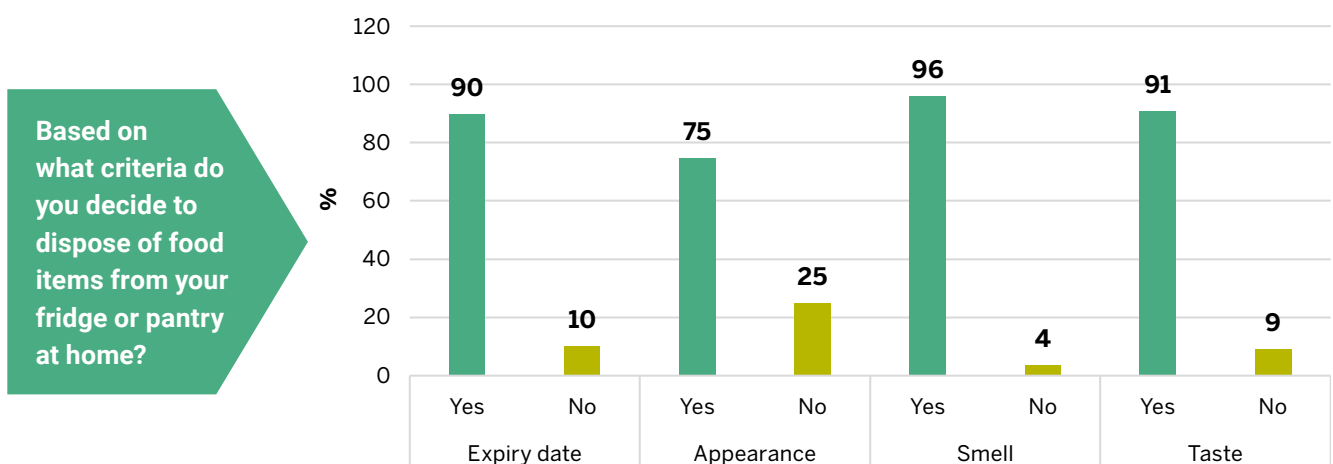
In the online survey, participants were asked questions regarding their attitudes and behaviours governing food waste generation. The results are discussed briefly below, and recommendations are made to address some of the common food waste challenges emerging from these results.

### → Based on what criteria do you decide to dispose of food items from your fridge or pantry at home?

In the survey results, most of the respondents indicated smell (96 per cent) and taste (91 per cent) as disposal criteria. At the same time an overwhelming majority (90 per cent) of respondents said they used the expiry date

as a factor influencing the disposal of food items at home (Fig. 5). Awareness campaigns can address this criterion by encouraging people to practice the “first-to-expire first-out” principle in their food handling; to perform a monthly inventory of their stock of food in the kitchen to highlight near- expiry-date items and use them as soon as possible; and to prepare a list of items before their food shopping visits so that they buy only what they need and not be tempted by the offers in the shops. Promoting food banks can be another strategy to encourage people to donate near-expiry packaged foods before they spoil. To address the issue of food appearance (75 per cent of respondents indicated food appearance was an issue (Fig5) ) people must be educated on alternatives to wasting fresh produce that appears “ugly.” This includes squeezing fruits and vegetables to yield juices or using vegetables in preparing soups.

**Fig. 5** The reasons behind disposing of food items in a sample from West Asia

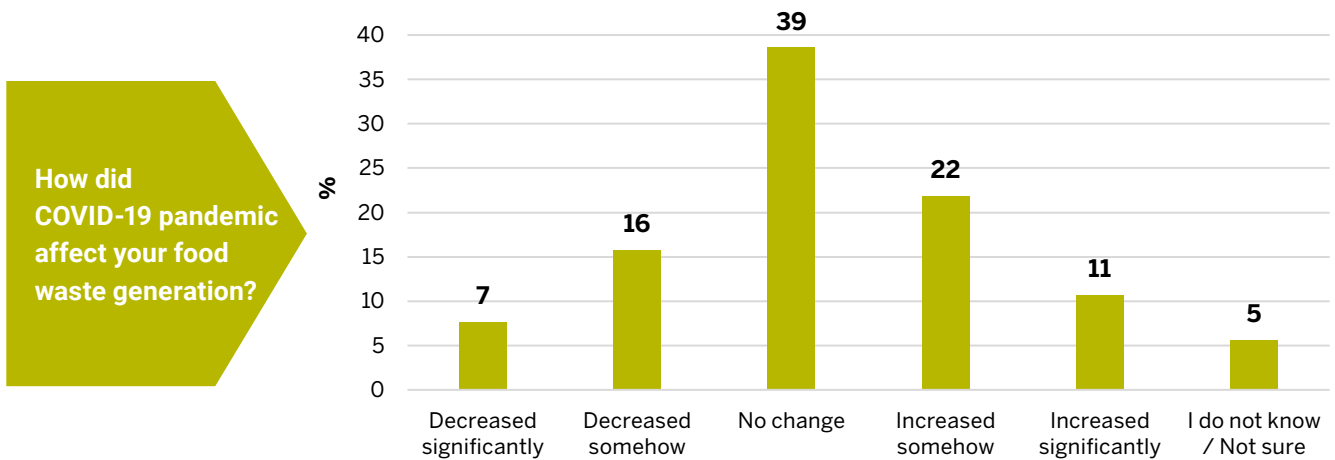


→ How did the COVID-19 pandemic affect your food waste generation?

Most respondents to the survey (67 per cent) reported “no change” or “decreased” food waste generation since the start of the COVID-19 pandemic; however, around 33 per cent answered that their food waste generation increased (Fig. 6). This can be attributed to the panic food shopping that occurred out of fears

that some food items may disappear from retailer shelves. Many of those food items likely ended up in the garbage, as they would expire before being able to be consumed. Moreover, staying at home encouraged people to cook, resulting in overproduction of food and a significant amount of wastage.

Fig. 6 The effect of COVID 19 on household food waste generation, in a sample from West Asia

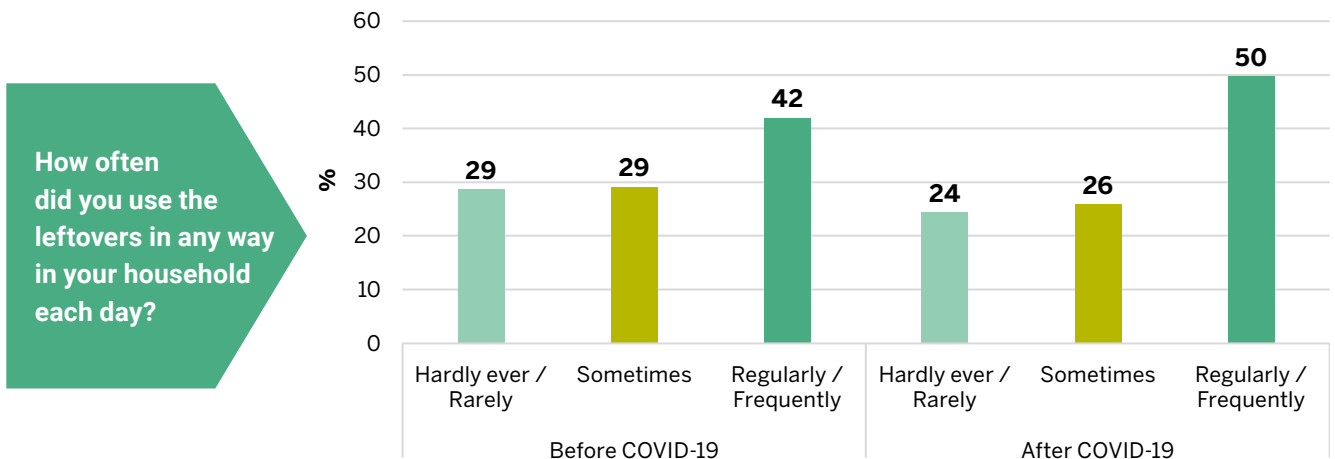


→ How often did you use the leftovers in any way in your household each day?

When people were asked about the use of leftovers in their households (leftovers were defined as any cooked/prepared and edible food that is thrown away, excluding peels, bones and uneaten raw food in its original shape), the share of respondents answering “regularly/frequently” increased between pre-COVID

(42 per cent) and post-COVID (50 per cent) (Fig. 7). This may be due to an increased interest in healthy eating to boost immunity, as home-made foods are generally known to be better in this regard. This would lead people to store leftovers for subsequent consumption instead of disposing of them.

Fig. 7 Recycling of food leftovers in West Asia, pre- and post-COVID-19

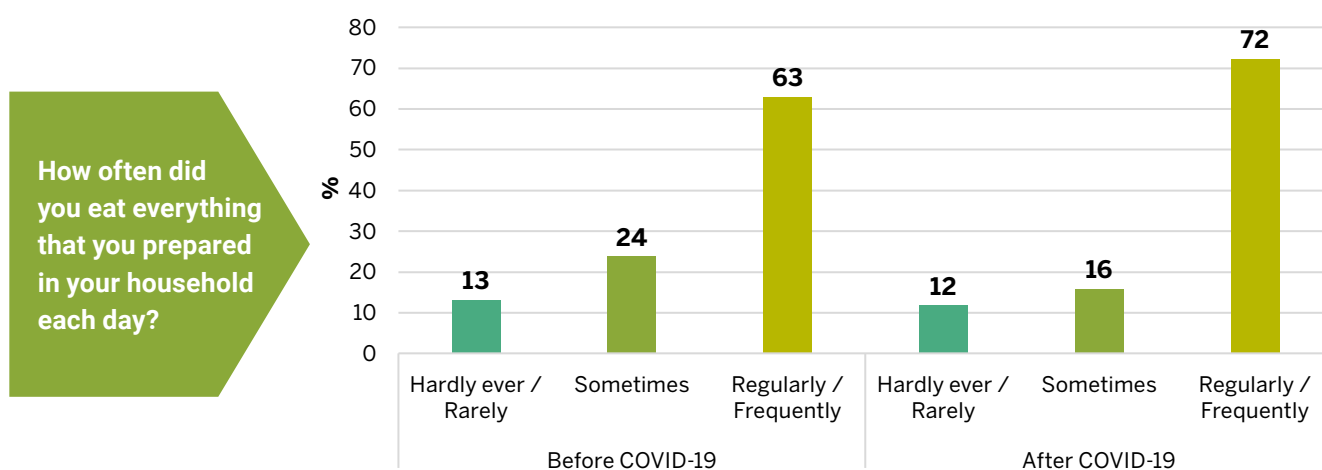


### → How often did you eat everything that you prepared in your household each day?

The answers to this question can confirm the assumption made in the previous paragraph. Respondents frequently eat everything that they

prepare at home (Fig. 8), a practice that has increased since the start of the pandemic (from 63 per cent to 72 per cent).

**Fig. 8** Consumption of prepared foods in various households in West Asia

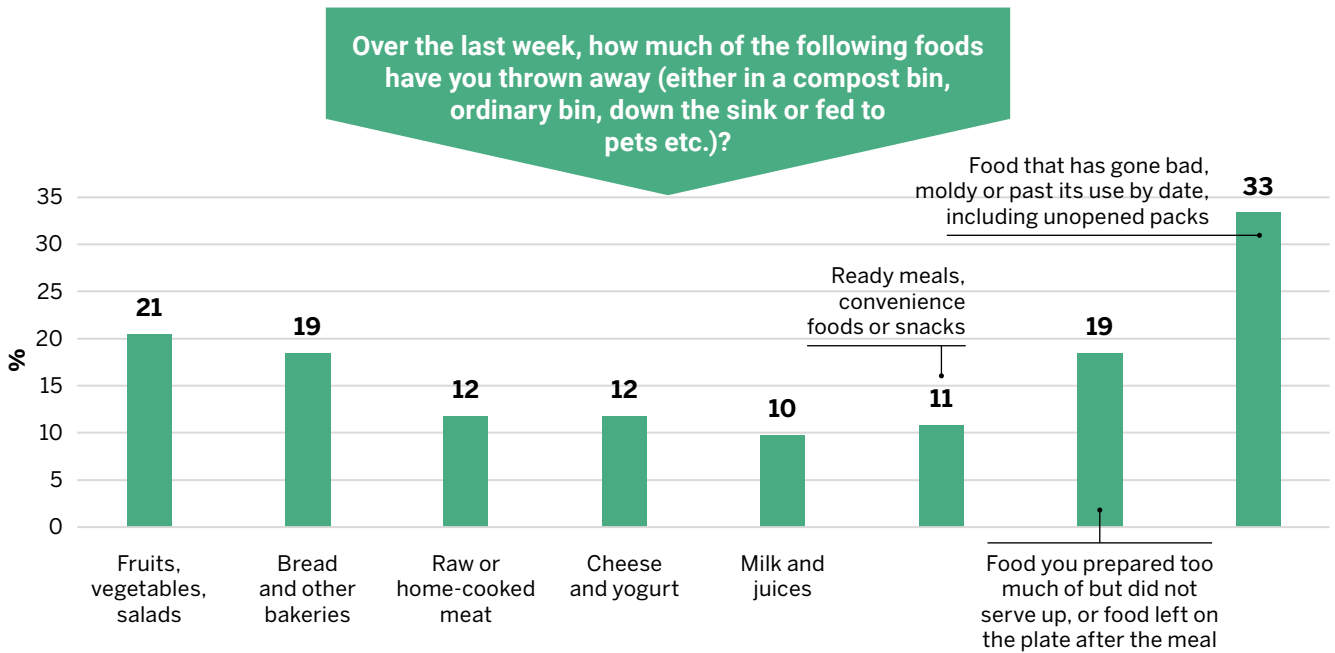


### → Over the last week, how much of the following foods have you thrown away?

Among the different fresh food categories (Fig. 9), fruits, vegetables and salads were reported as the most frequent contributors to food waste generation (21 per cent). In West Asia, many countries tend to have high environmental footprints, driven largely by the over-buying, over-preparation and overconsumption of foodstuffs (Zeitoun 2012). The region faces many challenges associated with food loss and waste, although accurate estimates of this loss and waste are not readily available. Adapted strategies and actions have to be devised to fit each country's circumstances or group of countries linked through a commodity supply chain. Involving all stakeholders – consumers, retailers, hospitality and the food industry, as well as governmental and non-governmental organizations – in tackling food waste should be sought and

encouraged. If the stakeholders do not show any changes in adopting good behaviours, practices, management styles, and technologies, food loss and waste will not be reduced. This waste can be tackled by increasing awareness of other ways to use produce, such as squeezing it to yield juice or cooking it to make soups. Bread and baked goods also contributed a high share of waste (19 per cent), which can be solved by collecting such waste separately and donating it for animal feed whenever possible. Meanwhile, 33 per cent of respondents reported throwing away bad and moldy food, which is justifiable (Fig. 9). However, they also disposed of unopened packaged foods past their expiry dates, highlighting the importance of buying only what is needed from food shops and keeping an eye on food stocks at home.

**Fig. 9** Distribution of food waste categories in households, in a sample from West Asia

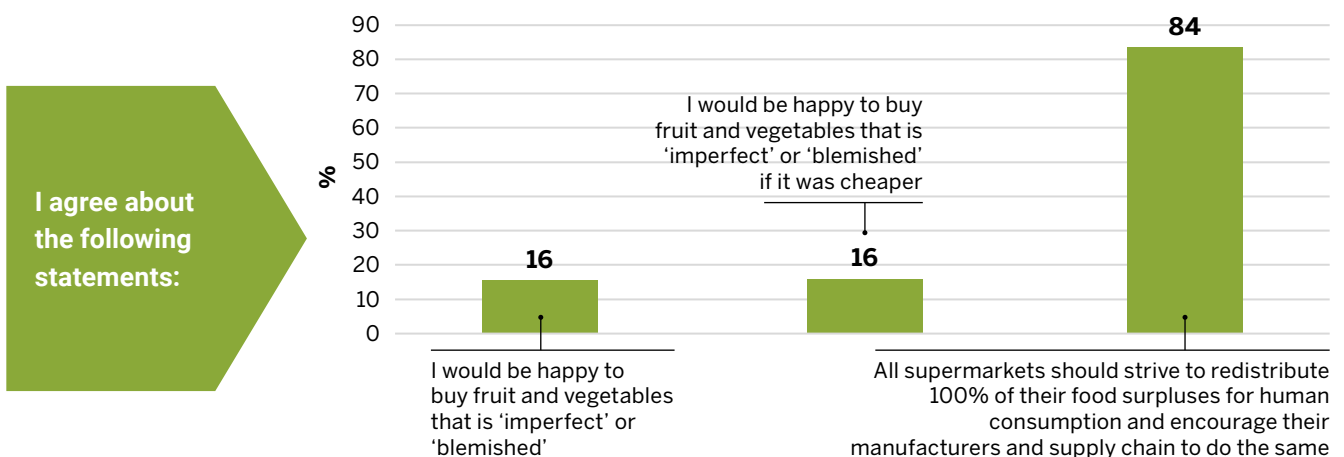


### Consumers' attitudes toward food waste mitigation and wasteful food practices (two questions)

When asked whether they would buy imperfect or blemished produce, even if the prices of these items are lower, only 16 per cent of respondents agreed (Fig. 10). Awareness of the value of low-quality produce can be raised at the retailer level by placing signs next to these items that suggest potential alternative applications (juices, pastes, soups, etc.), to encourage

customers to purchase them. Meanwhile, 84 per cent of respondents agreed that supermarkets should strive to redistribute surpluses and encourage manufacturers to do the same. This finding can encourage food shops to engage in partnerships with food banks and charity organizations for their surplus to be donated instead of being disposed of.

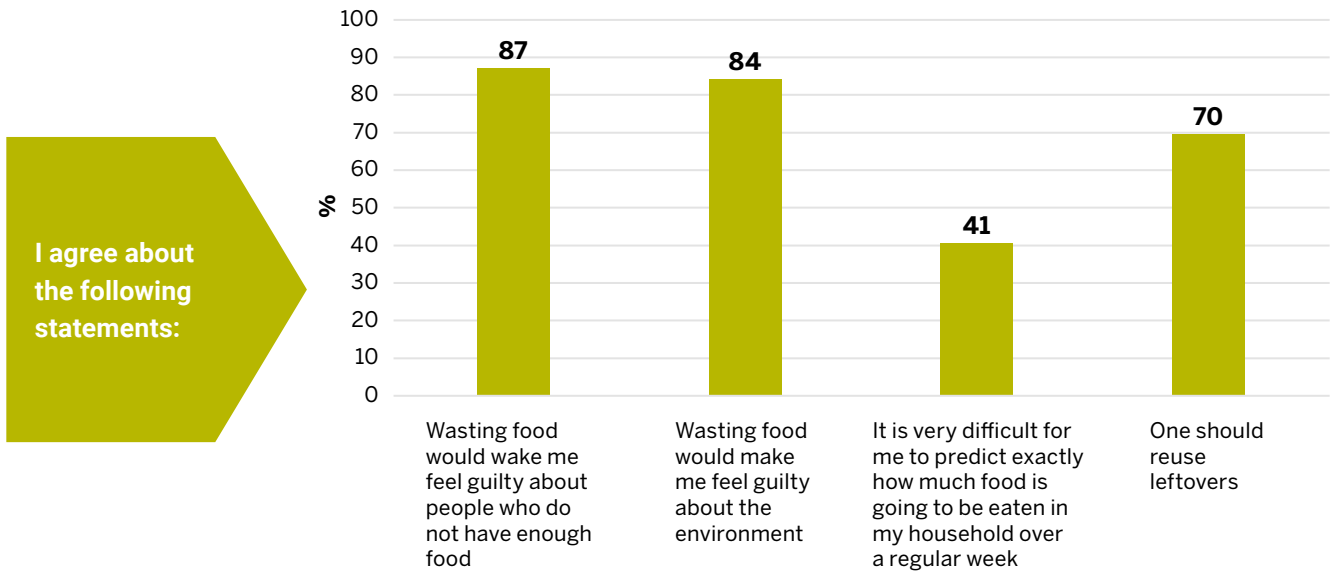
**Fig. 10** Consumers' attitudes regarding various actions to mitigate food waste in West Asia





Encouragingly, most respondents agreed (Fig. 11) that wasting food makes them feel guilty about people who do not have enough food (87 per cent) and about the environment (84 per cent). Nearly 70% agreed that they should reuse leftovers. This positive finding suggests that people in West Asia are willing to change their behaviour regarding food waste. However, policies must be developed and implemented, awareness must be raised, and additional food banks and similar initiatives must be in place in order to translate this willingness into impactful action.

**Fig. 11** Consumers' attitudes towards wasteful food practices in West Asia



In summary, one-third of the survey respondents reported an increase in their food waste generation following the emergence of the COVID-19 pandemic. However, respondents simultaneously increased their use of food leftovers. Due to the absence of quantitative studies on food waste generation in West Asia, obtaining data for pre- and post-COVID-19 comparisons was not feasible.



05

## CONCLUSION AND RECOMMENDATIONS

In West Asia, many countries tend to have high environmental footprints, driven largely by the over-buying, over-preparation and overconsumption of foodstuffs (Zeitoun 2012). The region faces many challenges associated with food loss and waste, although accurate estimates of this loss and waste are not readily available. Strategies and actions have to be devised to fit each country's circumstances or a group of countries, linked through a commodity supply chain. Involving all stakeholders – consumers, retailers, hospitality and the food industry, as well as governmental and non-governmental organizations – in tackling food waste should be sought and encouraged. If the stakeholders do not show any changes in adopting good behaviours, practices, management styles, and technologies, food loss and waste will not be reduced.

With its rapidly growing population and the associated rise in food expenditures, West Asia as a whole and many countries individually can no longer afford to ignore the prevailing high levels of food loss and waste. However, little will be achieved if the magnitude and causes of food loss and waste are not identified and addressed through appropriate and adequate policies, strategies and programmes. The public sector will not progress in reducing food waste unless most of the region's population is brought on board.

Public institutions will likely remain the main driving force behind the reduction and mitigation of food loss and waste. Among other measures, they can ensure the development and implementation of appropriate policies, an institutional framework, a proper environment for private actors, adequate and sustained awareness campaigns, and introducing innovation.

The link between food loss and waste and food security and food availability has yet to be well established. In contrast, existing actions to reduce food loss and waste tend to offer much more significant gains and/or benefits. In some instances, a given initiative to reduce food waste at one outlet might generate food waste at another. For example, reducing food prices might encourage over-buying and potentially generating food waste at the consumer level, although it was intended to minimize the waste at the retail level. Smart decisions and proper initiatives should be well thought out when trying to tackle food waste. Thus, carefully designed and integrated programmes will have to be developed, notably as part of the 2030 Agenda for Sustainable Development or overall implementation of the SDGs.

While measuring food loss and waste and setting targets is critical, what ultimately matters are the actions being implemented.

## Recommendations for Governments and Small and Medium Enterprises

- **Measure baselines and report progress on SDG 12.3:**
  - Collecting data on national food loss and waste generation enables governments to understand the scale of the problem, target hotspots, assess the efficacy of policy interventions and track progress towards 2030.
  - A common methodological framework has been developed by the FAO (the Food Loss Index) and UNEP (the Food Waste Index) to improve comparability and the development of common strategies and programmes. It should be used for households, retail, the food service sector and the food supply chain, as well as for specific food commodities such as wheat, potatoes, fruits and vegetables, etc.
  - Governments and companies need to set targets and adopt an explicit food loss and waste reduction goal. It would be important to also consider how the food loss and waste is connected to the role of women entrepreneurs and employees in the food production value chain: for instance, how the various policy/legal efforts and initiatives on the ground can support (and most importantly do not discriminate against) women producers and operators, as well as employees, in the value chain to perform better, gain more market share, move up the value chain, etc., as well as to guarantee decent work conditions. Many initiatives globally are promoting women in the food sector, which can have both positive environmental and social impact, such as the economic empowerment of disadvantaged women, poverty reduction, early childhood development and nutrition, etc.
- **Improve knowledge and raise awareness to promote good practices:** Increasing awareness about food loss and waste – highlighting its magnitude, detrimental effects, and scope; where it happens; and what could be done to reduce it – can effectively contribute to reducing its occurrence. Raising awareness of the impact of food waste on the environment and food security, and the financial benefits of reducing food waste, is important, as well as promoting gender-inclusive strategies across the food value chain.
- **Adopt appropriate policies and adopt an adequate regulatory framework:** Policies and institutions are the main drivers for reducing food loss and waste. Appropriate policies should be developed to encourage stakeholders to adhere to directives while encouraging various supply chain operators to invest and adjust.
- **Promote investments to adopt and transfer technologies:** Given the magnitude of food loss and waste in West Asia, an increase in investments needs to go hand in hand with adopting and transferring appropriate technologies. Governments' investments to improve the capital asset have to complement those from the private sector geared towards adopting and/or transferring established technologies. These investments should be made along the entire food supply chain from farm production to post-harvest storage, handling, processing (including sustainable cold chains), and retail and consumer levels. It is critical that these efforts are gender responsive, guaranteeing equal access to both men and women to technologies, financing opportunities and adequate capacity-building.





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