Standing Committee
for Economic and Commercial Cooperation
of the Organization of Islamic Cooperation (COMCEC)

COMCEC

Reducing Food Waste in the OIC Countries

COMCEC COORDINATION OFFICE

January 2017

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LIST OF ABBREVIATIONS

ABP	Animal by-products
ACE	Afghanistan Centre for Excellence
AFED	Arab Forum for Environment and Development
ANDES	French National Association for the Development of Solidarity Groceries
COMCEC	Standing Committee for Economic and Commercial Co-operation of the Organization of Islamic Cooperation
CO_2	Carbon dioxide
DLC	Expiry date
DLUO	Deadline for optimal use
EPA	US Environment Protection Agency
EU	European Union
FAO	United Nations Food and Agriculture Organisation
FBAO	Food Bank Foundation Onlus
FBRN	Arab Food Bank Regional Network
FDA	Saudi Food and Drug Association
FLW	Food Loss and Waste
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GHG	Greenhouse Gas emissions
IFAD	International Fund for Agricultural Development
INSEE	French Institute for Statistics and Economic Studies
HLPE	High Level Panel of Experts on Food Security and Nutrition
MSW	Municipal Solid Waste
NENA	Near East and North Africa
NGO	Non-Governmental Organisation
NHS	UK National Health Service
OIC	Organisation of Islamic Cooperation
QSR	Quick Service Restaurants
RSW	Residential Solid Waste
SESRIC	Statistical, Economic and Social Research and Training Centre for Islamic Countries
SIK	Swedish Institute for Food and Biotechnology
TISVA	Turkey Waste Prevention Foundation
UAE	United Arab Emirates
UN	United Nations
UNEP	United Nations Environment Programme
UNDS	United Nations Statistics Division
10YFP	10-Year Framework for Programmes on Sustainable Consumption and Production Patterns
US	United States of America
WFP	World Food Programme
WRAP	Waste & Resource Action Programme
WRI	World Resources Institute

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EXECUTIVE SUMMARY

The report aims to provide analysis and insights that can contribute to reducing household and food service sector food waste in the OIC Member Countries. It does this by setting the work within a conceptual framework and understanding of food waste within households and the food service sector globally. An overview of the current food waste situation is reviewed in terms of extent and causes, identification of measures and practices, and policy recommendations for consideration.

The focus of the study is on food waste in households and the food service sector. For this study, the term 'food waste' also encompasses 'food loss'. Food loss is defined as a "change in the availability, edibility or quality of food that makes [it] unfit for human consumption", and food waste, which is "a consciously destroyed or rejected potential source of food, including inedible parts that could be used for animal feed" (FAO, 2011; Parfitt et al., 2016).

The methodology used included a literature review, interviews with key informants, three field visits (Cameroon, Saudi Arabia and Turkey) to inform in-depth case studies, and a further set of surveys undertaken in Afghanistan, Benin, Senegal and Uzbekistan. The scope of the study included all 57 OIC Member Countries.

A conceptual framework drawn from institutional research and literature is presented in Chapter 1. It provides a review of the development of food waste definitions, and how food waste is categorized at home and in the food service sector as avoidable, potentially avoidable and unavoidable waste. Within this context, an overview of global food waste is set, and in many instances, draws on work undertaken by the United Nation's Food and Agriculture Organisation (FAO). With food waste gaining a more prominent position globally, several key global and regional initiatives are also highlighted.

Chapter 2 summarizes the major causes and consequences of food waste in households and the food service sector, and provides global insights. Factors affecting household waste, such as size and composition, income and culture are investigated further. Research suggests that there are four main causes of food waste at home:

- Poor planning of purchases,
- Confusion about date labelling,
- Poor storage or stock management, and
- Poor food preparation.

Within the food service sector, it is recognized that with growing urbanization within OIC Member Countries, this category of food waste is on the increase. It has been estimated in Europe that approximately 12% of all food waste is generated from this sector (WRAP, 2011). The sector is comprised of private (e.g. restaurants and hotels) and public (e.g. hospitals and schools) sectors. The most common causes for food waste in the sector are meal preparation, customer leftovers and management of surplus food.

Food waste has a direct impact on the environment, social and economic dimensions of a country. These issues are explored in Chapter 2. The disposal of food waste at home and in the food service sector directly impacts the entire food supply chain – from farm to plate – in terms

of impact on water, energy use, greenhouse gas emissions (GHG) and land use. Considering that an estimated 78% of household food waste could be avoided (WRAP, 2011), any reduction would lead to an environmental improvement along the supply chain. From a social and economic perspective, food waste equates to a waste of money, and as with environmental impacts, this is felt along the supply chain. These wastes require compensation somewhere along the chain, and often this is in the price of food purchased by the consumer.

The results of a literature survey on household and food service sector waste in the OIC Member Countries is provided in Chapter 3. Research suggests that most data available on food waste is for post-harvest and the processing of products, with little attention on the consumer phase. As such, an overview of the situation in the OIC Member Countries has been presented for FAO regional levels in which OIC Member Countries are situated. Estimates for household and food service food waste in the main regions of the world where OIC Member Countries are located are:

- South and Southeast Asia: 25 million tonnes per year,
- North Africa, West and Central Asia: 15 million tonnes, and
- Sub-Saharan Africa: 5 million tonnes.

Table 1: Total food waste, by region and food type, per year

Food types	Sub-Saharan Africa		North Africa, Central & Western Asia		South & Southeast Asia	
	Tonnes (million)	% of total food chain	Tonnes (million)	% of total food chain	Tonnes (million)	% of total food chain
Cereals	0.8	4%	7.6	29%	9	10%
Roots & tubers	1.3	2%	0.7	16%	1.4	4%
Oilseeds & pulses	0.2	4%	0.2	10%	0.5	2%
Fruit & vegetables	2.2	9%	4.3	9%	11.8	13%
Meat	0.2	6%	0.9	30%	0.8	16%
Fish & seafood	0.0	0%	0.0	0%	0.2	5%
Milk & eggs	0.0	0%	1.0	9%	1.2	4%
Total	**5**	**4%**	**15**	**15%**	**25**	**9%**

Source: Adapted from SIK (2013)

A few studies on food waste in individual OIC Member Countries or regions do exist, and were referenced to provide an overview of research undertaken to date. Results from these studies indicate that household food waste is widespread in all countries, and the quantity of food thrown away depends on household composition and the time of year.

Research on food service sector food waste is minimal, however a few studies, such as those undertaken in the United Arab Emirates (UAE) and Malaysia highlight the issue of buffets generating significantly more waste than *Al a carte*.

A variety of initiatives to curb food waste are provided in Chapter 3, with a focus on food banks, as these are adopted by several OIC Member Countries to redistribute or donate food. The food bank model adopted in Egypt is highlighted as an example of good practice.

Chapter 4 explores the motives for consumers to reduce food waste at home and in food service establishments. This is set within the critical global issue of food security, which is high on the agenda of many OIC Member Countries, especially as many rely on food imports. In addition, many OIC Member Countries have insufficient food production capacity to meet domestic demand. Reducing food waste represents one way to solve the food crisis. It is within this context that this study tables the adoption of sustainable food systems to strengthen and make OIC Member Country food chains more resilient to fluctuations in supply and cost.

The legal, social and cultural context and measures to reduce food waste in the OIC Member Countries is analyzed in Chapter 5. A review of legislation across member countries reveals that very few have legislation that focuses on food waste. However, many do have general waste management or environmental legislation which does or could encompass food waste reduction, but this varies across countries, from non-existent to well-established. The most notable examples include:

- Turkey's 'Circular on Bread Waste Prevention', and Egypt's 'Bread Subsidy Smartcard' to reduce bread waste.
- Indonesia's 'Law on Food' which focuses on self-sufficiency but sees optimal consumption of food as a solution to self-sufficiency.
- Pakistan's 'One-dish' law to reduce excessive food consumption and waste generated at weddings.
- Qatar's ground-breaking National Dietary Guidelines which integrate principles of food sustainability (including waste) and nutrition.

Given the importance of date labels as a major contributing factor to food waste at home, it is within the legislative context that they are explored further. A review of date label legislation adopted by OIC Member Countries suggests that those that do specify content for food labels do so for food imported into the country. However, little information was found on food date labels and shelf-life in OIC Member Countries. Examples, such as Turkey and Saudi Arabia do refer to the inclusion of use-by and best-before dates on labels, with Saudi Arabia specifically requesting labels needing to minimize confusion for consumers.

The survey results and case studies are discussed in Chapter 6, and cover the extent and main causes for food waste in the surveyed countries: Afghanistan, Benin, Cameroon (case study), Saudi Arabia (case study), Senegal, Turkey (case study) and Uzbekistan. A summary of the findings provides insights into the variations that exist within some of the OIC Member Countries. Whilst not able to use the results as a reflection of total food wasted for all OIC Member Countries, the results do provide a good indication of consumer practices in the Member Countries. Table 2 provides a summary of estimated household food waste per surveyed country.

Table 2: Estimated household food waste per surveyed country, per year

Country	(Kgs)
Afghanistan	2,820
Benin	48
Cameroon	304
Saudi Arabia	716
Senegal	1,218
Turkey	1,445
Uzbekistan	2,543

Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.

Household food waste

Households most commonly throw away fruit, vegetables and bakery products. Milk is rarely discarded. Within households, the findings suggest the main causes for food waste are concerns about food poisoning or food reaching its expiry date, and cooking or serving too much. Whilst many households noted they do use shopping lists and plan meals in advance, there is still a tendency to over-purchase, and this was sometimes down to the influence of promotions.

Table 3 provides a summary of estimated food service sector food waste per surveyed country, and Table 4 drink waste.

Table 3: Estimated food service food waste, per survey country, per year

Country	(Kgs)
Afghanistan	2,686
Benin	2,628
Cameroon	1,562
Saudi Arabia	403
Senegal	9,064
Turkey	3,782
Uzbekistan	2,133

Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.

The main reasons the **food service sector** generates food waste is due to too much food being prepared (e.g. unsure of customer numbers), food reaching its expiry date, customers ordering too much, and the stigma attached to customers taking leftovers home. Many felt their customers' behavior was the biggest driver for food waste, with a number referencing children as culprits. Buffets as a serving option created the most waste for all respondents. The main food types thrown away were fruit, vegetables and salad, meat, chicken, fish and milk.

Table 4: Estimated food service drink waste per survey country, per year

Country	(Liters)
Afghanistan	983
Benin	514
Cameroon	1,198
Saudi Arabia	330
Senegal	9,606
Turkey	1,256
Uzbekistan	1,350

Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.

The literature review, case studies and surveys have highlighted that data, an awareness of food waste and some benchmark initiatives do exist. However, there is much variability between the countries in terms of volumes generated, particularly at a more granular level. This is likely due to respondents providing inaccurate estimates due to poor literacy levels. Supporting evidence is also disparate, with a few regional and country-wide studies available for comparison. This highlights the need for further investigation into the issue of food waste in the OIC Member Countries to build on this study, which provides a good indicative platform from which to improve the robustness of the data.

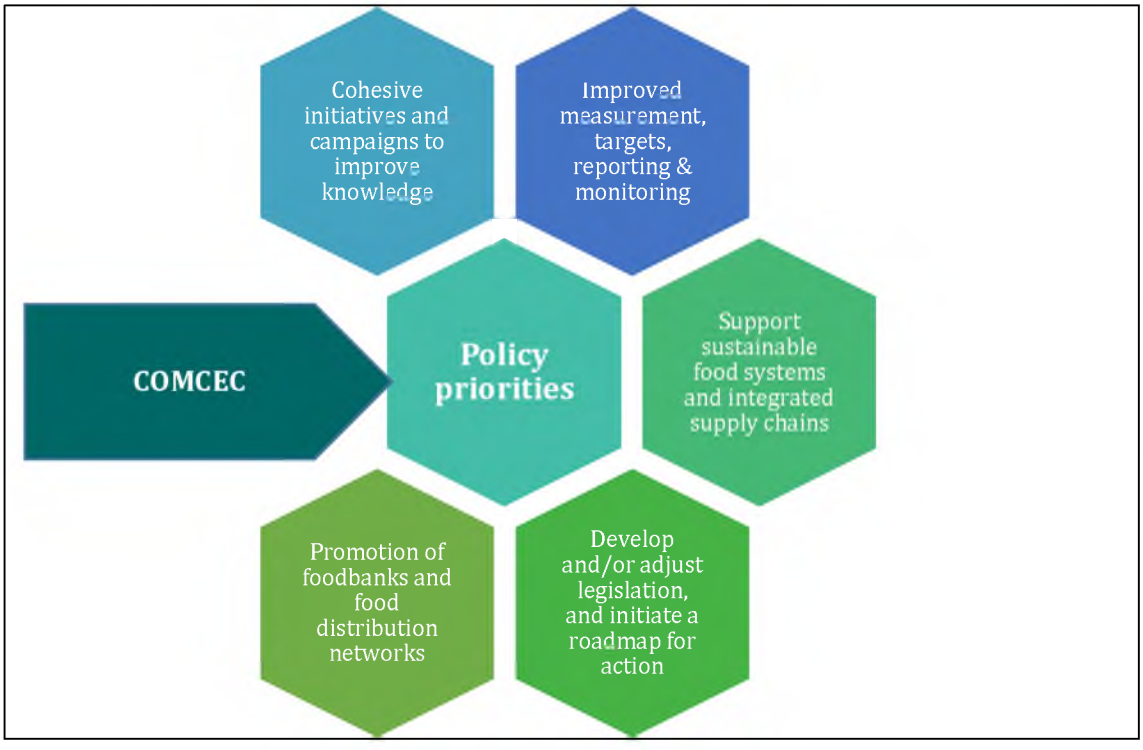
However, it is still possible to identify and report on the main attributes, reasons and causes for food waste in the OIC Member Countries:

- Larger households and their impact on volumes of food waste.
- The impact of social and religious events creating a spike in food waste e.g. weddings and large-scale social events.
- Fruit, vegetables and bakery are the most commonly discarded products.
- Within the households surveyed, food reaching its expiry date is the most common reason given for throwing away food.
- Most household waste is generated at the preparation stage, and is likely to be avoidable, therefore something can be done to reduce it.
- Food service waste mainly occurs during the preparation stage, or due to consumers ordering too much or leaving leftovers on their plates. The latter contributes significantly to food waste in this sector, yet with the stigma attached to taking leftovers home, this area is likely to be a challenge.

Chapter 7 outlines several policy interventions identified during and from this research for OIC Member Countries to consider. These being:

- Improved measurement, targets, reporting and monitoring.
- Support sustainable food systems and integrated supply chains.
- Develop and/or adjust legislation, and initiate a roadmap for action.
- Promotion of food banks and food distribution networks.
- Cohesive initiatives and campaigns to improve knowledge and awareness.

Figure 1: Overview of policy recommendations



The picture emerging from this study is one of diversity among the member countries. Having said that, opportunities to reduce food waste are available, and several good practice examples exist both globally and within OIC Member Countries from which to build a roadmap to reduce food waste for the future.

INTRODUCTION

The Standing Committee for Economic and Commercial Co-operation of the Organization of Islamic Cooperation (COMCEC) has been working to enhance economic and commercial cooperation among its 57 Member Countries since 1984 (See Annex 1). As one of the co-operation areas of the COMCEC, the agriculture sector has great potential for the socio-economic development of the Organization of Islamic Cooperation (OIC) Member Countries. However, this potential has not been fully realized due to various reasons and constraints. COMCEC therefore aims to help Member Countries to overcome the challenges faced in agriculture.

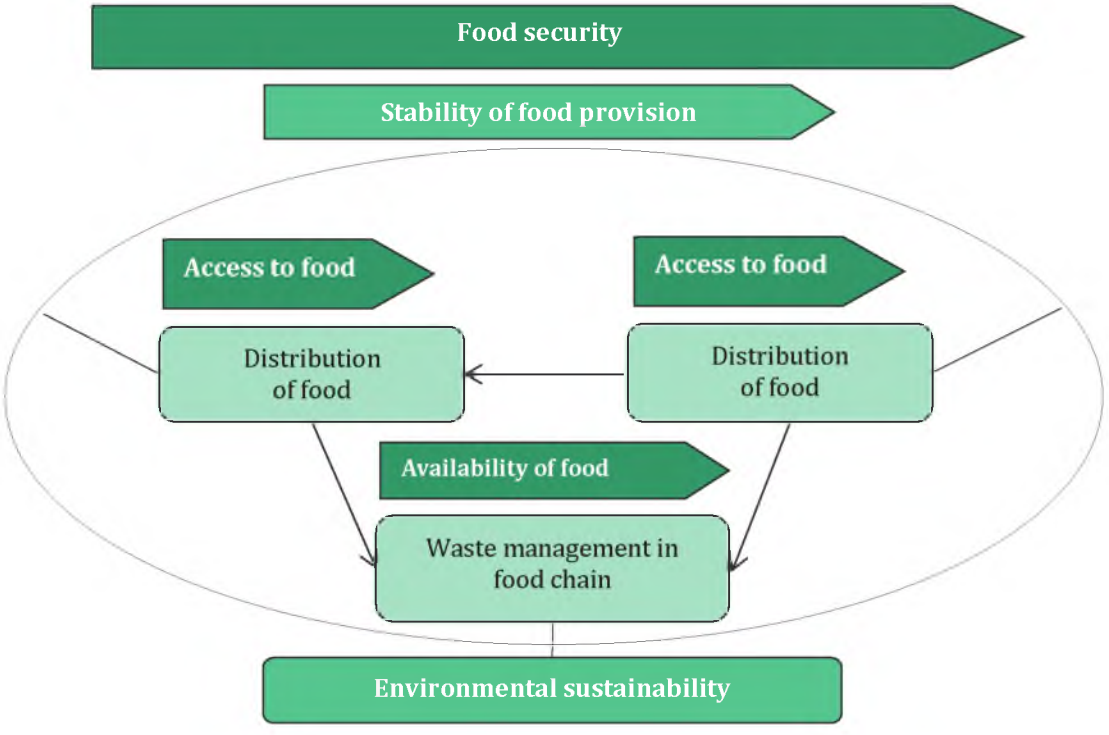
The Food and Agriculture Organization of the United Nations (FAO) (2011) estimates that each year approximately one-third of food produced for human consumption in the world is lost or wasted. According to a European Union (EU) FUSIONS report, EU-28 countries produce 88 million tonnes of food waste on average every year. About 65% of this is generated from households and the food service sector. This equates to a person throwing away, on average, 113kg of food per year in the EU (FUSION, 2016). This waste represents a missed opportunity to improve global food security, but also to mitigate environmental impacts and resource use from food chains.

This food waste is set within the context of many OIC Member Countries facing structural and dynamic challenges which impact on food security, supply chains and scale of food waste. These include:

> **Structural** – for example, high population growth, increasing urbanization, a scarce and fragile natural resource base, limited capacity to expand food production, and high exposure to climate change (FAO, 2014), and
>
> **Dynamic** – for example, changing food preferences and rising incomes, double burden of malnutrition, food price volatility, exposure to international food markets and conflicts and political instability, etc (FAO, 2014).

In terms of food security, OIC Member Countries are not unique in this regard, with food security becoming an increasing concern globally, particularly in developing and poorer countries (Aljamal and Bagnied, 2012). Food security is inextricably linked to food waste. When food is scarce, this scarcity could be alleviated by reducing food waste not only post-harvest, but also through the consumer food demands. In countries where food is scarce, there are also often issues with food poverty, with many millions of people going hungry – as highlighted by the former Director General of Pakistan's Environment Protection Agency (Anon., 2014). This linking of the two issues has been represented by UNEP. See Figure 2.

Figure 2: Link between food security and food waste



Source: UNEP (2014)

In addition, the increasing food price crisis has brought the issue of food waste into sharp focus, and many countries, international and inter-governmental organizations and NGOs have paid attention on to how to reduce it.

In response to the volumes of food wasted globally, and where understood nationally, several significant initiatives have been implemented to curb food waste growth. For example, the launch of the 'SAVE FOOD: Global Initiative on Food Loss and Waste Reduction' by the FAO and Messe Düsseldorf in 2011 (FAO, 2016b) - a global partnership of organisations wishing to reduce food waste and eradicate hunger. Other significant global activities include the United Nation Environment Program's (UNEP) 'Think.Eat.Save: Reduce your foodprint' campaign (launched in 2012), and most recently the coming together of executives from governments, businesses, international organisations, research institutions, farmer groups and civil society to accelerate progress toward achieving the Sustainable Development Goal Target 12.3 by 2030 (Champions123, 2016a).

Probably one of the most recognised initiatives is the United Kingdom's Waste & Resources Action Programme's (WRAP) 'Love Food Hate Waste Campaign', which has set a precedent for undertaking food waste research and delivery of a highly successful food waste reduction campaign.

The growth in interest in food waste research has also led to the development of a 'Food Loss and Waste Protocol', launched in 2016 by the World Resources Institute (WRI), to bring co-ordination to reporting and accounting.

Within this context, this research has been commissioned as part of a series of three studies commissioned by the COMCEC Coordination Office, which covers all stages of the food supply chain. The other studies include 'Reducing On-Farm Food Losses in the OIC Member Countries' (published in March 2016), and 'Reducing Post-harvest Losses in the OIC Member Countries' (published in October 2016).

The overall objective of this analytical study is to inform activities to increase the efficiencies of the agriculture sector and to contribute to food security in the OIC Member Countries by reducing food waste. Prior to this research, the issue of food waste for OIC Member Countries has remained poorly understood. As such, the purpose of this study is to present an overview of the current situation. It assesses the extent of food waste and the main reasons for and consequences of food waste. Initiatives undertaken by member countries are illustrated to demonstrate the approaches and practices food waste can be reduced. Furthermore, the study provides policy recommendations for OIC Member Countries to trigger collaborative action, and encourage the development and implementation of cost-effective and innovative solutions to reduce food waste.

The methodology adopted for this study included:

- A desk-based literature review of existing food waste assessments, the works of international institutions and organizations as well as specific country reports and analysis.
- A total of 100 household and 103 food service sector establishment surveys were conducted in Cameroon; 111 and 94 in Saudi Arabia, and 110 and 100 in Turkey respectively. A further 20 household and 20 food service sector surveys were conducted in Afghanistan, Benin, Senegal and Uzbekistan.
- Three in-depth case studies on Cameroon, Saudi Arabia and Turkey were undertaken.

A conceptual framework and definitions of food waste are provided to set the research in context. In addition to findings on legislative, social and culture measures implemented in member countries, the scale of food waste has also been estimated using FAO data. To understand country-specific level activity, three in-depth case studies for Cameroon, Saudi Arabia and Turkey were undertaken, and broader surveys in Afghanistan, Benin, Senegal and Uzbekistan. These case studies provide insights into the nature of food waste arisings in households and the food service sector, and the behaviors and causes of food waste. The information was gathered from a series of interviews and surveys in all three countries.

1. CONCEPTUAL FRAMEWORK FOR FOOD WASTE

International institutions and the literature define food waste differently, as such there is no single definition, and no consistent and comparable data. The causes of food waste are multiple and diverse along the different stages of the food chain, and the scale differs within regions. This section reviews the main definitions of food waste, identifies types of food waste that occur and highlights the main global initiatives to reduce food waste.

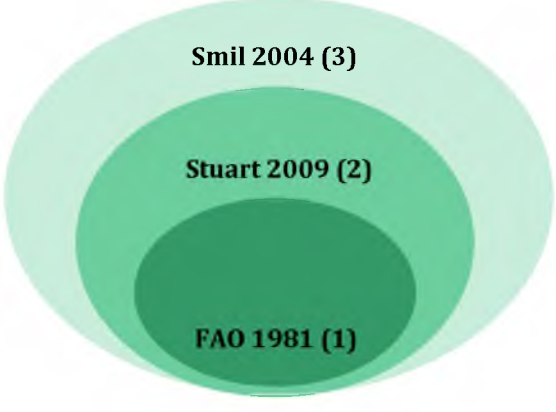
1.1. Definitions

There are differences in the various definitions applied to food waste. This is partly due to a lack of consensus (Lebersorger & Schneider, 2011). In the basic form, 'food loss' and 'food waste' mean 'throwing uneaten food' away.

> **Food losses:** The FAO defines food losses as a "change in the availability, edibility or quality of food that makes them unfit for human consumption". This includes food loss during the phases of agricultural production, post-harvest and processing (FAO 1981). These losses can be attributed to climatic and environmental factors e.g. weather damage and poor agricultural farming practices or infrastructure.
>
> **Food waste:** Stuart defines food waste as that which is "a consciously destroyed or rejected potential source of food, including inedible parts that could be used for animal feed". It can also include an "action to sort and discard deliberately or consciously a food source while it is perfectly edible."

In a study commissioned by the United Nation's Food and Agriculture Organization (FAO), the Swedish Institute for Food and Biotechnology (SIK) states that 'food losses and waste' refer only to products intended for human consumption (FAO, 2011). Parfitt et al. (2016) go further and identify three main definitions for food waste (see Figure 3):

Figure 3: Main definitions of food losses and waste



(1) Wholesome edible material intended for human consumption, arising at any point in the food supply chain that is instead discarded, lost, degraded or consumed by pests (FAO, 1981).

(2) As (1), but including edible material that is purposefully fed to animals or is a by-product of food processing diverted away from human food provision (Stuart, 2009).

(3) As definitions (1) and (2) but including over-nutrition - the gap between the energy value of consumed food per capita and the energy value of food needed per person (Smil, 2004).

Source: Adapted from Parfitt et al (2016)

These definitions do not take into consideration that "we throw [away] food that has deteriorated, but could be used if the consumer had culinary and household skills to avoid this degradation"(Esnouf et al., 2011). Other authors also propose to consider over-consumption as a form of food waste (e.g. Stuart, 2009).

For the purposes of this study, 'food waste' includes both 'food loss' and 'food waste' and refers to the edible parts of plants and animals produced or harvested for human consumption that do not reach their intended original purpose. It represents a decline in the mass, calorific and/or nutritional value of edible food intended for human consumption. Food waste can occur at each stage of the supply chain - from harvesting, transport, storage, packaging, processing, wholesale and retail trade and consumption (Table 5).

Table 5: Examples of food waste at different stage of the food supply chain

Stage	Examples of food waste characteristics
1. Harvesting e.g. handling at harvest	Edible crops left in field, crop damage etc
2. Threshing	Waste through poor technique
3. Drying, transport and distribution	Waste due to spoiling/bruising
4. Storage	Waste through pests, spillage, contamination
5. Primary processing e.g. grading	Process wastes and contamination
6. Secondary processing e.g. cooking	Process wastes and contamination
7. Product checking e.g. quality control	Product discarded
8. Packaging e.g. weighing, sealing	Inappropriate packaging damages produce
9. Marketing e.g. selling and distribution	Damage during transport, poor handling
10. Post-consumer e.g. cooking, eating	Poor storage and preparation, 'use by dates
11. End of life e.g. disposal	Landfill, animal food

Source: Adapted from Parfitt & al. (2016)

Consumer food waste occurs toward the end of the food chain, predominantly in retail, food service and at home. This study focuses particularly on food waste generated at home or when eating out (food service).

1.2. Categorizations of food waste

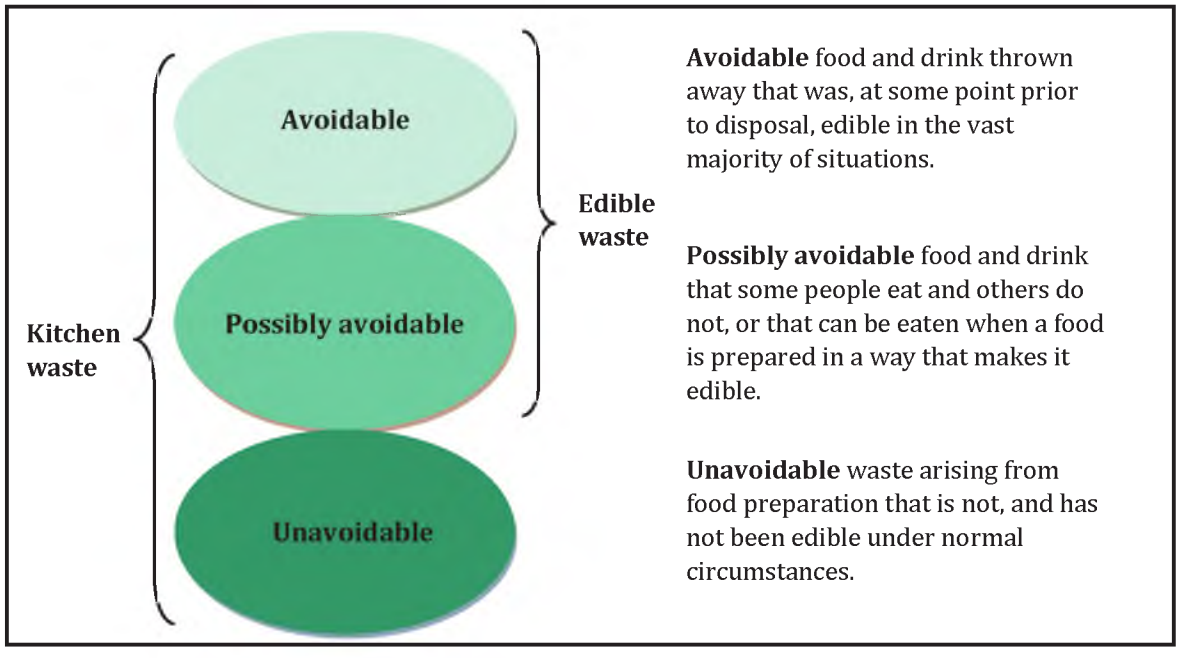
Food waste can be classified into three categories:

1) **Avoidable losses:** Refers to food and drink thrown away because they are not used, e.g. they have exceeded their expiry date. Most avoidable losses are composed of foods that were, at one time not edible prior to disposal. A proportion of the food has deteriorated and become inedible at the time of disposal e.g. decomposed.,
2) **Possibly avoidable losses**: Refers to food that people discard e.g. apple peels or bread crusts that could be eaten, or that can be eaten if prepared in a way that makes them consumable e.g. potato skins, or are edible but discarded as they do not meet aesthetic criteria e.g. crooked carrots.
3) **Unavoidable losses**: includes waste from food and preparations which cannot be eaten under normal circumstances e.g. apple cores, banana and orange peels, tea leaves, coffee grounds and egg shells. In addition, losses related to harvesting,

storage, transport and treatment which cannot be avoided by using the best technologies available and within reasonable additional costs are also classified as unavoidable (Beretta et al, 2013; Quested & Johnson, 2009).

Figure 4 illustrates the differences between these three food waste categories.

Figure 4: Definitions associated with food and drink waste



Source: adapted from WRAP (2009)

Most studies differentiate 'avoidable' and 'unavoidable' food waste, but the definitions are not consistent. For example Langley et al. (2010) and Schneider & Obersteiner (2007) consider all preparation by-products and residues of food preparation inedible and therefore 'non-avoidable', while WRAP (2009) uses an additional sub-category of 'possibly avoidable food'. This sub-category is defined as "food and drink that some people eat and others do not or that can be eaten when a food is prepared in one way but not in another" e.g. peeling mushrooms. For avoidable food, studies generally agree that whole unused and partly consumed food would be avoidable, but differ in the classification of post-preparation and consumption residues. These are presented in Table 6 below.

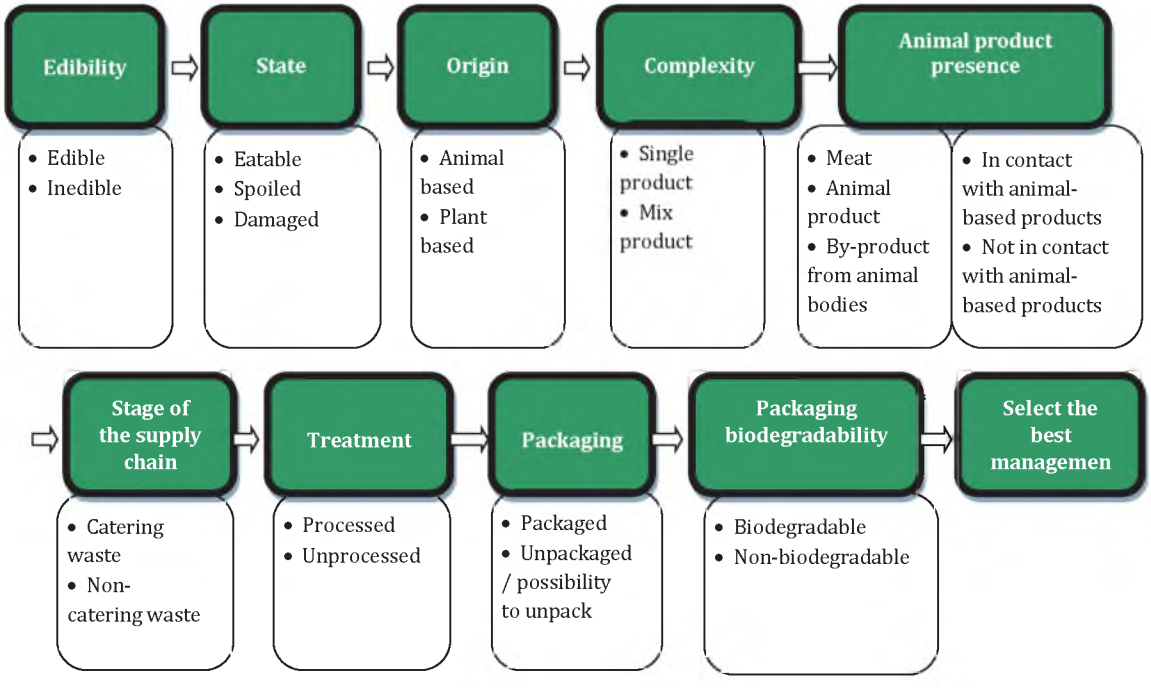
At its most basic, food waste is categorized by its type e.g. fruits and vegetables, roots and tubers, cereals, meat, milk, fish and seafood (e.g. WRI, 2013). However, Garcia et al. (2015) propose a nine-stage categorization which is based on characteristics associated by types of food waste created along the food supply chain (see Figure 5). The intention of this categorization is to enable the selection of management options to minimize environmental impact and maximize the social benefit and economic output of the process.

Table 6: Variations in the classification of food waste

Sub-category	Langley *et al* (2010)	Schneider & Obersteiner (2007)	WRAP (2009)
Preparation residues	Unavoidable	Unavoidable	Unavoidable or possibly avoidable
Post-preparation and consumption residues	Avoidable	Partly avoidable	Avoidable or possibly avoidable
Post consumed food	Avoidable	Avoidable	Avoidable
Whole unused food	Avoidable	Avoidable	Avoidable

Source: Adapted from Parfitt (2016)

Figure 5: Garcia et al's nine-stage categorization of food waste

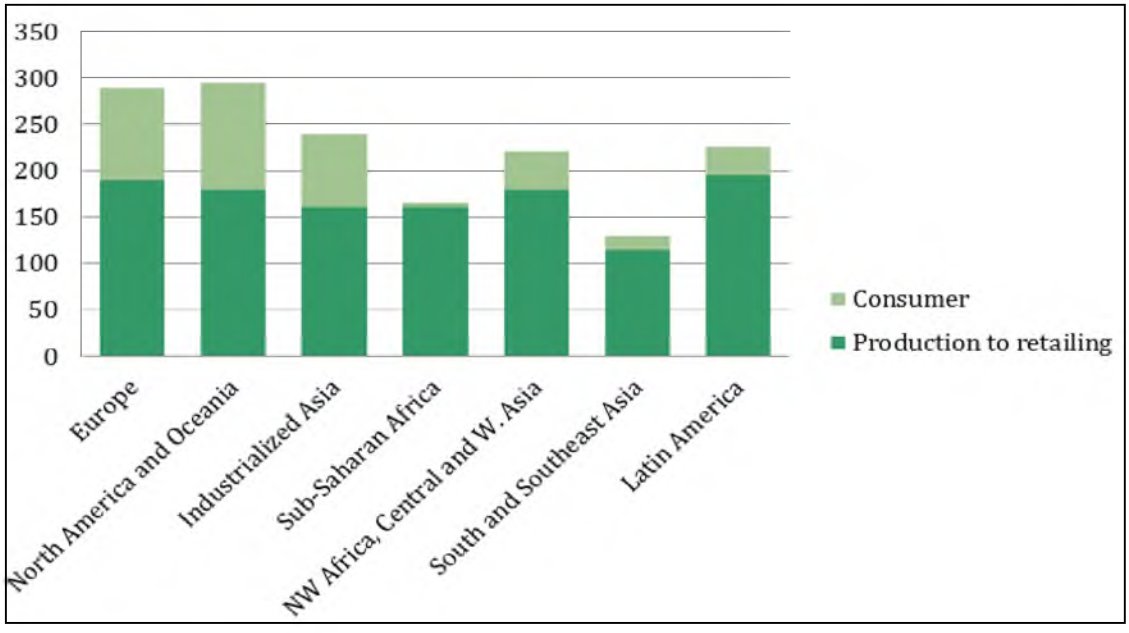


Source: Garcia et al. (2015)

1.3. Global overview of food waste

The main source of data on global food waste was published by the FAO in 2011, and provides data by region and product categories (types). The results suggest there are significant differences between rich and developing countries e.g. in Europe and North America 280-300kg of food waste is generated per year per person, while in Sub-Saharan Africa, South Asia and Southeast Asia 120-170kg per person is generated per year. For the latter, more than 40% of waste is recorded during post-harvest and processing, while in developed countries 40% occurs in distribution and consumption. In Sub-Saharan Africa, consumers are only responsible for 3.5% of food waste generated, with the rest generated prior to consumption (Gustavsson et al., 2011). Figure 6 illustrates these differences.

Figure 6: Regional per person food waste pre- and during consumption

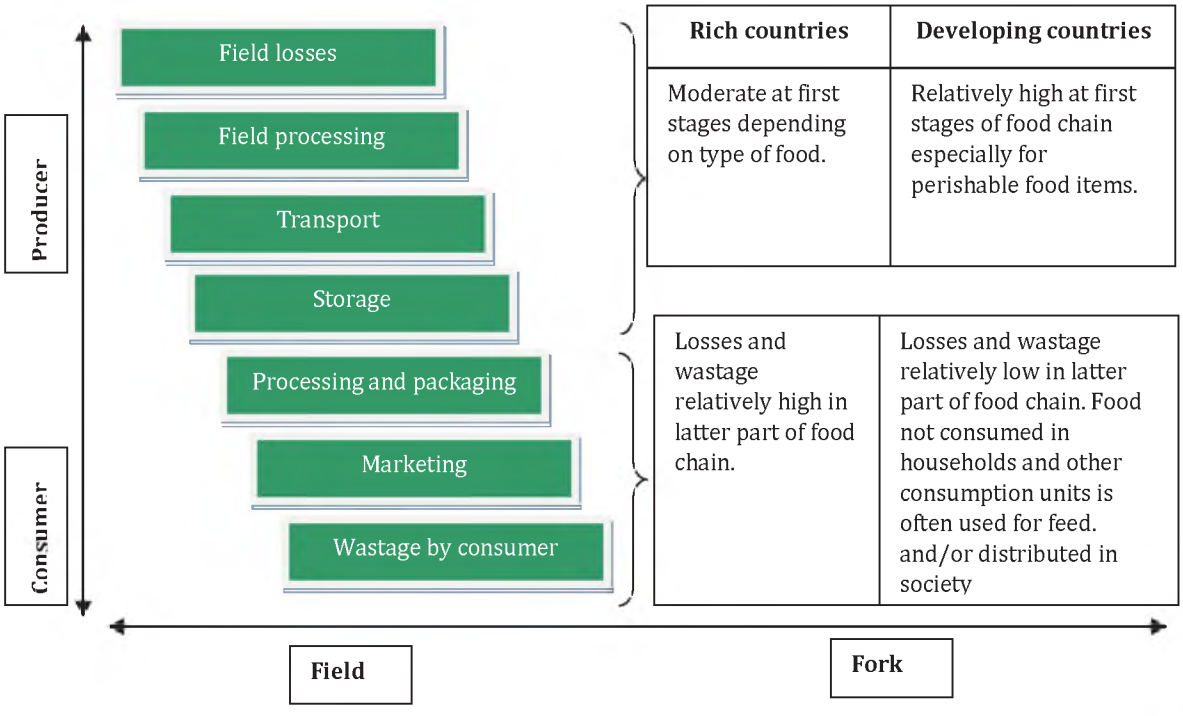


Source: Gustavsson et al (2011)

In medium and high income countries causes of food waste are related primarily to consumer behavior, and in the food service sector buying too much food and incorrect cooking methods (e.g. cooking too much), farmers leaving food in fields due to market forces, aesthetic specifications, weather conditions, damage caused by pests, and a lack of co-ordination between various actors in the supply chain (Gustavsson et al., 2011; Gunder, 2012). In contrast, food waste in developing countries generally arises due to poor farming and harvesting techniques, lack of efficient transportation and distribution infrastructure, inadequate storage and cooling, and retail (BCFN, 2012) (see Figure 7).

SIK (2013) estimates fruits and vegetables (by weight) represent 44% of total food wasted (an estimated 1.3 billion tonnes globally), followed by roots and tubers (20%) (see Figure 8). Using the FAO 'Food Balance Sheets', Lipinski et al. (2013) converted these estimates into calories. At 53%, cereals represent more than half of all food wasted (see Figure 9).

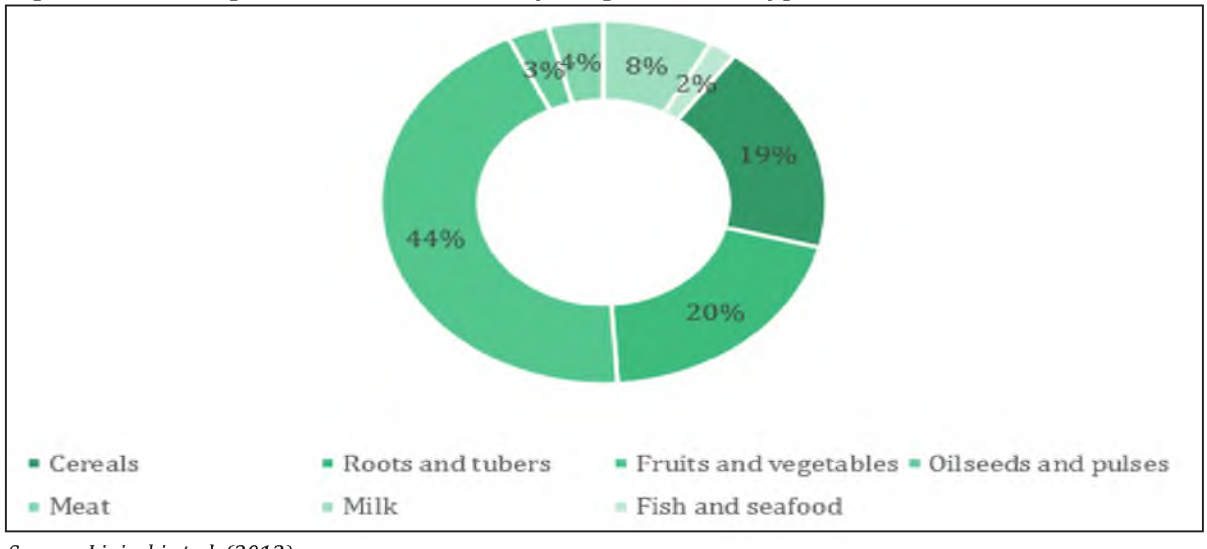
Figure 7: Food waste differences between developed and developing countries



Rich countries	Developing countries
Moderate at first stages depending on type of food.	Relatively high at first stages of food chain especially for perishable food items.
Losses and wastage relatively high in latter part of food chain.	Losses and wastage relatively low in latter part of food chain. Food not consumed in households and other consumption units is often used for feed. and/or distributed in society

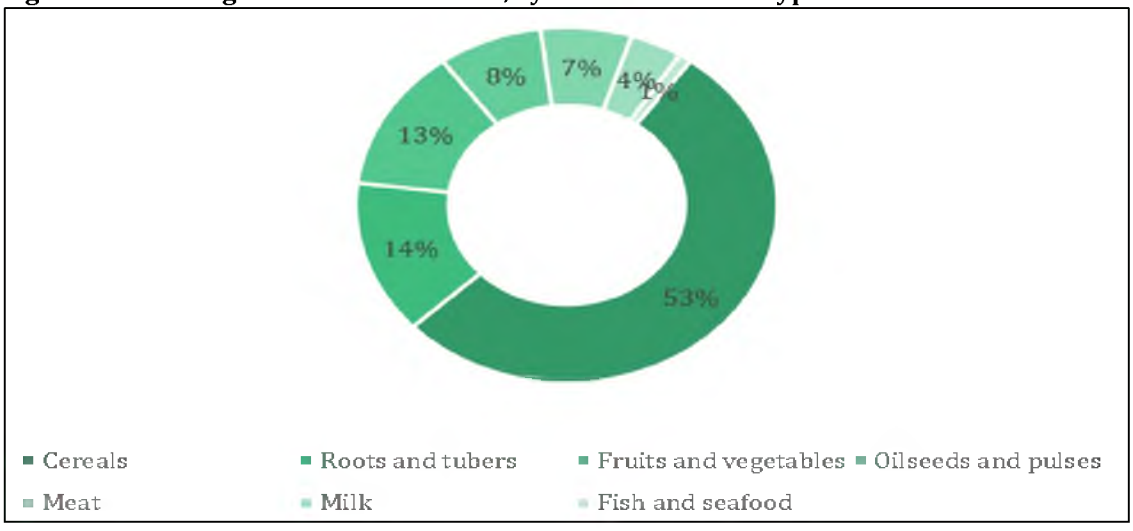
Source: BCFN (2012)

Figure 8: Share of global food waste sales, by weight and food type



Source: Lipinski et al. (2013)

Figure 9: Share of global food waste sales, by calories and food type



Source: Lipinski et al. (2013)

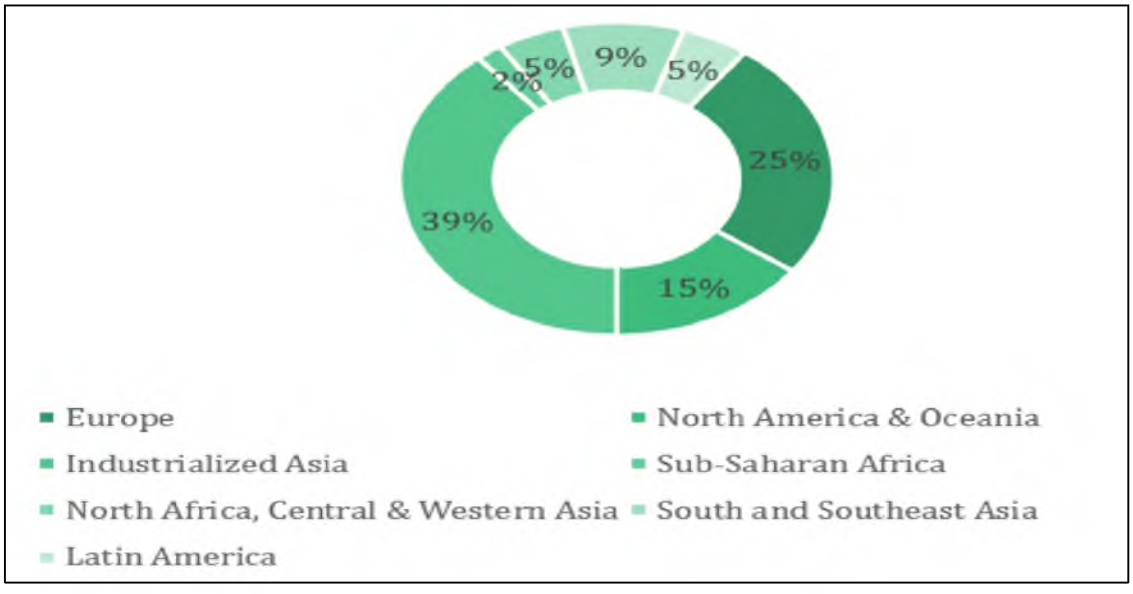
1.4. Importance of food waste

Food waste at the consumer stage is predominantly associated with food purchased by consumers, restaurants and caterers and is that which is not eaten. According to the FAO, the total volume of food wasted globally at the consumer stage is 280 million tonnes, or 22% of a total 1.3 billion tonnes (SIK, 2013). Of this, nearly 80% is wasted by consumers in developed countries, and 20% in developing countries. By region, waste generated by consumers ranges from 110 million tonnes in Industrialized Asia to 69 million tonnes in Europe, 42 million tonnes in North America, 25 million tonnes in South and Southeast Asia, 15 million tonnes in North Africa, Central and Western Asia and Latin America, and 5 million tonnes in Sub-Saharan Africa. Figure 10 shows the regional food waste contributions.

As shown in Table 7, per person food wasted is highest in North America & Oceania (115kg), Europe (95kg) and Industrialized Asia (73kg). The Table also shows calories lost, with the highest calorific loss occurring in North America & Oceania (61%).

The most perishable foods account for the highest proportion of food wasted – these include fresh fruit and vegetables, followed by bakery and dairy products, and meat and fish (Pekcan et al., 2006; WRAP, 2008; Morgan, 2009; Thomissen, 2009). A summary of food types wasted is illustrated in Figure 11.

Figure 10: Food waste sales, by region



Source: Adapted from SIK (2013)

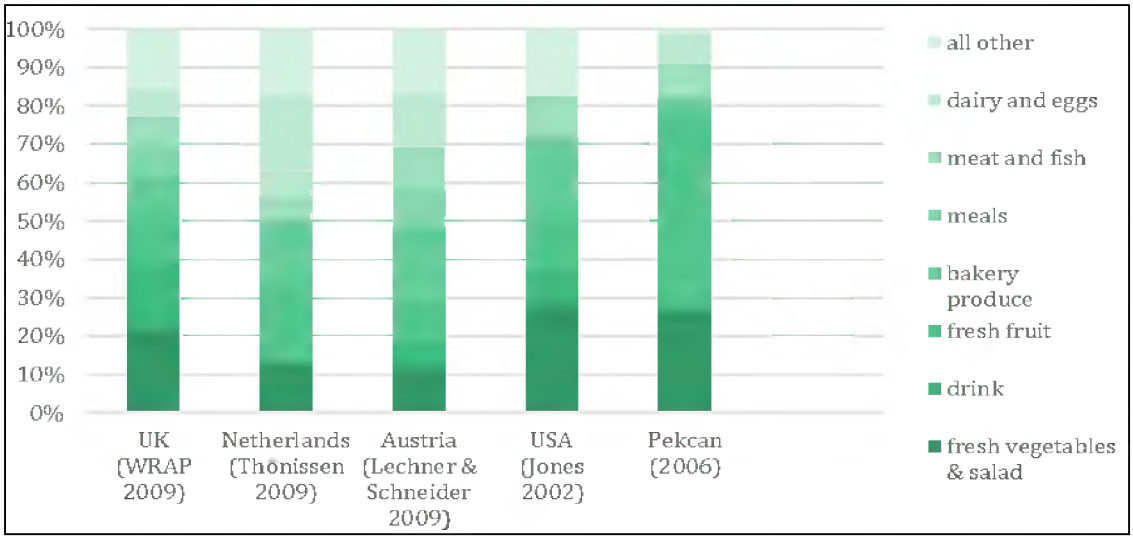
Table 7: Food waste per person per year, by region

Region	(Kgs)	% of total	% of total
Europe	95	34%	52%
North America & Oceania	115	39%	61%
Industrialized Asia	73	31%	46%
Sub-Saharan Africa	6	4%	5%
North Africa, Central & Western Asia	33	15%	34%
South & Southeast Asia	11	9%	13%
Latin America	25	11%	28%

Source: Adapted from FAO (2011), Lipinski (2013) and SIK (2013)

From a socio-economic perspective, recent evidence from Turkey, South Africa and Australia suggests that lower-income groups waste less food than higher income groups in terms of weight, calories and spending (Table 8) (Cuesta, 2014). This clearly illustrates that higher-income households are responsible for generating the most household food waste (by volume and cost). Table 8 illustrates this variance in relation to other regional data for Sub-Saharan Africa, South and South-Eastern Asia, and Europe and North America.

Figure 11: Summary of household food waste by food type, across five countries



Source: Parfitt et al. (2010)

Table 8: Food waste per capita, by socio-economic group for selected countries

Country	Per capita per day (g) and per year (kg)		
	Lower-income group	Middle-income group	Higher-income group
Turkey	274g (100kg)	285g (104kg)	319g (116kg)
South Africa	410g (150kg)	740g (270kg)	1,290g (471kg)
Sub-Saharan Africa, South & South-Eastern Asia	16g (6kg)		30g (11kg)
Europe and North America	260g (95kg)		315g (115kg)

Source: Turkey and South Africa (adapted from Cuesta, 2014); Sub-Saharan Africa, South & South-Eastern Asia and Europe and North America (adapted from FAO, n.d.).

1.5. Initiatives to reduce food waste

Food waste reduction initiatives have been implemented by several international, supra-national and national organizations. These initiatives reflect that food waste has evolved into a high-profile public issue. Some of these key initiatives are:

1.5.1. Global initiatives

SAVE FOOD: Global Initiative on Food Loss and Waste Reduction

At a global level, one of the key initiatives is SAVE FOOD - launched by the FAO and Messe Düsseldorf in 2011 (FAO, 2016b). It is a global partnership of public and private sector organizations and companies wishing to reduce food waste and eradicate hunger. The programme rests on four main pillars:

- **Creating awareness** on the impact of, and solutions for food waste through a global communication and media campaign, the dissemination of research findings and regional congresses.
- **Collaboration and co-ordination** of world-wide initiatives on food waste reduction.
- **Policy, strategy and programme development** for food waste reduction.
- **Capacity building, technical and managerial support** for projects piloting and implementing food waste reduction strategies by the private and public sectors.

The initiative is supported by other United Nations (UN) organizations, notably the World Food Programme (WFP), the International Fund for Agricultural Development (IFAD) and the United Nations Environment Programme (UNEP). These organizations work together under the vision of the UN Secretary-General's 'Zero Hunger Challenge', with its fifth element to achieve 'zero loss or waste of food'.

SAVE FOOD covers the following regions: European Union, North America and Australia, Japan and The Republic of Korea, Eastern Europe, Central Asia, North Africa and the Near East, Sub-Saharan Africa, South and East Asia and the Pacific, Latin America and the Caribbean.

Think.Eat.Save: Reduce your foodprint

In 2012 a global campaign to cut food waste was launched by UNEP, the FAO and partners. The campaign is part of the SAVE FOOD initiative and targets food wasted by consumers, retailers and the food service sector (hospitality). The campaign harnesses the expertise of organizations such as WRAP, Feeding the 5,000 and national governments. Think.Eat.Save aims to accelerate action and provides a global vision and information-sharing portal for global food waste initiatives (www.thinkeatsave.org).

To ensure consistency and joined up practice, UNEP together with WRAP, the FAO and the SAVE FOOD Initiative have published 'Guidance on the Prevention and Reduction of Food and Drink Waste'. This document guides governments, local authorities and businesses on ways to reduce food waste and save natural resources. The guidance also provides a basis for targeted action.

Sustainable Food Systems Programme (SFS)

The 10-year framework of programmes on sustainable consumption and production patterns (10YFP) is a global framework of action to enhance international co-operation to accelerate the shift towards sustainable consumption and production in both developed and developing countries. This programme is one of many programmes co-ordinated by UNEP under the Sustainable Consumption and Production Patterns (10YFP) banner, adopted at the Rio+20 Conference in 2012. The Sustainable Food Systems (SFS) Programme aims to promote sustainability along the food value chain, from farm to plate through activities such as awareness raising, capacity development, facilitating access to knowledge and information, and strengthening partnerships. It brings together existing initiatives and partnerships. The Programme focuses on priority activities such as the promotion of sustainable diets and the reduction of food waste (UNEP, 2016).

The Food Waste Resolution

In June 2015, four-hundred food retailer and manufacture members of the Consumer Goods Forum signed a commitment to prevent food waste and maximize its recovery towards the goal of halving food waste within their supply chains by 2025 (on a 2016 baseline) (Consumer Goods Forum, 2015). Their intention is to also support wider UN goals on the issue of food waste. The Resolution specifically commits to aligning the industry around the 'Food Loss and Waste Protocol' developed by the World Resources Institute (WRI).

Champions 12.3

Similar to 'The Food Waste Resolution', Champions 12.3 is a consortium of executives from governments, businesses, civil society, international organisations, research institutions and farmer groups dedicated to accelerating progress toward achieving the Sustainable Development Goal (SDG) Target 12.3 by 2030 (Champions123, 2016a). This target is one of eight that falls within the over-arching SDG 12 'Sustainable Consumption and Production: Ensure sustainable consumption and production patterns' target. The target aims to:

> *By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses (United Nations, 2015).*

The Champions 12.3 initiative was adopted at the 2015 United Nations General Assembly Sustainable Development Summit. The consortium's aspirations are to:

- Commit to halving food waste within their supply chains by 2025 (on a 2016 baseline),
- Lead by example on how to reduce food waste,
- Showcase and communicate success, and
- Advocate for improving conditions to speed up a reduction in food waste.

Food Loss and Waste Protocol

With an increased interest in food loss and waste, and the need to develop evidence and understand the scale of the issue, numerous methodologies have been used to do so. In order to bring some semblance to reporting and accounting the WRI recently launched 'The Food Loss and Waste Protocol' (FLW Protocol)(WRI, 2016). It is a multi-stakeholder initiative for quantifying food and associated inedible parts removed from the food supply chain. The protocol provides guidance on how to gather and calculate food loss and waste. The WRI also provides secretariat support to the Campions 12.3 initiative.

1.5.2. Regional initiatives

At a regional level, the most notable initiative is the European Union's (EU) **Food Use for Social Innovation by Optimizing Waste Prevention Strategies (FUSIONS**) project (EU, 2016). The aim of the project was for the 21 project partners from 13 EU states to work towards a more resource efficient Europe by significantly reducing food waste. The project started in 2012 and completed mid-2016. A set of conclusions were presented and adopted by the Council in June 2016 which recognizes the role EU countries have in reducing food waste, that it is a significant issue and linking the issue to food security and hunger is imperative. In response to these conclusions, the Council called on its member states to:

- Confirm their commitment to the achievement of SDG 12.3,
- Welcome the outcomes of the FUSIONS project, e.g. developing a common and practical EU monitoring protocol for measuring food waste reduction,
- Actively contribute to the EU Platform on Food Losses and Food Waste,
- Encourage implementation of the waste management hierarchy and the food use hierarchy by prioritizing the prevention of food waste,
- Support education and awareness-raising on sustainable food production processes, consumption and food waste,
- Aim to reduce food waste and valorize food resources from primary production through to consumption,
- Put the issue of food waste reduction on the agenda of the various actors of the food value chain, and promote inter-sectorial cooperation to prevent food waste from farm to fork, and
- Take into account food waste issues in discussions and initiatives on using raw materials more sustainably (General Secretariat of the Council, 2016).

1.5.3. National initiatives

With food waste gaining more prominence globally, numerous country-specific initiatives are emerging. It is not possible to list and comment on all initiatives. Some of the more groundbreaking and notable initiatives and campaigns are highlighted below.

Love Food Hate Waste: United Kingdom

The most long-standing and recognized initiative is the Waste & Resources Action Programme's (WRAP) 'Love Food Hate Waste' campaign (WRAP, 2016). The aim of the campaign is to raise food waste reduction awareness in citizens and companies in the United Kingdom (UK). The programme was developed off the back of significant investment in ground-breaking evidence-based research which aimed to understand how much food UK households were throwing away, what food types and the reasons and behaviors behind disposal. A seminal report 'Household Food and Drink Waste in the UK' was published by WRAP (WRAP, 2007) which provided the backbone for future research and the 'Love Food Hate Waste' campaign. Due to the success of the programme, WRAP have been called on by many countries and institutions, such as the UN's Think.Eat.Save campaign to provide guidance and facilitate the roll-out of similar initiatives globally.

Two other notable country-specific initiatives and actions have been implemented in Italy and France.

Last Minute Market and the Food Bank Foundation Onlus: Italy

Italy has a long history of recognizing food waste and setting up initiatives for redistribution. Almost 20 years ago, the 'Last Minute Market' was set up, initially as a research project to recover surplus food from business and manufacturing activities, produce not harvested and left in fields, and ready-made meals from the food service sector. In 2003 it become a country-wide commercial business.

In 1989, the Food Bank Foundation Onlus (FBAO) was established to collect surplus food from agriculture, the food industry, large-scale retailers and franchise restaurants to redistribute to organizations that deal with aid and assistance. In 2011, over 68,000 tonnes of food were recovered and collected for those in most need.

Most recently, Italy made headlines with the introduction of a law to relax regulations that prohibit the redistribution of food through donations (Kirchgaessner, 2016). The aim of the law is to encourage firms to donate food and lift restrictions on e.g. the use of leftover bags by restaurants. It also clarifies that food may still be donated even if it is past its sell-by date, and allows farmers to transfer produce to charities at no extra cost if it has not been sold.

French National Association for the Development of Solidarity Groceries: France

In 2010, the French National Association for the Development of Solidarity Groceries (ANDES) was set up as a network to address the problem of hunger and malnutrition. The solidarity stores are commercial businesses where low income consumers can purchase everyday products at about 10-20% less than their normal retail price. One of the key objectives of the ANDES network is to reduce fruit and vegetable waste by collecting unsold but still edible products that would otherwise be destroyed, from the distribution channel.

As with Italy, France also recently made history with the introduction of a law which bans supermarkets from throwing away or destroying unsold food (Chrisafis, 2016). In February 2016, France became the first country in the World to initiate a ban on supermarkets from throwing away or destroying unsold food approaching its best-before date, and making them donate it to charities and food banks. The law was spurred on by civil society and anti-poverty campaigners opposed to food waste generated by French supermarkets. The law also prohibits supermarkets from deliberately spoiling food to prevent it from being eaten by people who forage in bins (Chrisafis, 2016).

Food Recovery Challenge: United States of America

Launched by the United States of America's (US) Environmental Protection Agency (EPA), the 'Food Recovery Challenge', challenges participants to minimize their food waste to save money and improve their local communities (EPA, 2016). Companies that join the program need to carry out an assessment of the food waste they generate, establish a three-year goal to reduce food waste sent to landfill, identify and undertake activities to reduce food waste, and track and report progress.

All the initiatives highlighted above strive for more efficient food waste management, increased food donations, and changes in behavior. Internationally, more co-ordinated efforts are advocating raising awareness, setting targets, the transfer of knowledge and technologies, and resource mobilization (Cuesta, 2014). Several OIC Member Countries have also initiated policies and programs to reduce food waste. These are covered in more detail further in the report.

2. MAJOR CAUSES AND CONSEQUENCES OF FOOD WASTE

This section explores both generic household and food service sector food waste, the reasons for waste generation and the environmental, economic and social impacts associated with food waste.

2.1. Household food waste

2.1.1. Definitions

Definitions of a household, even those used in population censuses, vary (FUSIONS, 2016). The UK's census (2011) defines a household as one person living alone; or a group of people, not necessarily related, living at the same address who share cooking facilities and a living or sitting room or dining area. The French Institute for Statistics and Economic Studies (INSEE) defines a household as all persons sharing the same main residence without necessarily being blood-related. A household can also be constituted as a single person (INSEE, 2016).

Measurements of household food waste should therefore include only that generated from homes (households). It concerns food and drink cooked or prepared at home but uneaten. Food may be wasted at three points:

1) Between coming into the home and preparation,
2) Between preparation and serving, and
3) After serving (plate waste or leftovers).

Household food waste excludes e.g. care homes, schools, prisons, hotels, restaurants and guest houses, which are classified as the food service sector; and pet food (FUSIONS, 2016). It can be classified into three categories: avoidable, possibly avoidable and unavoidable (WRAP, 2009; Parfitt, 2016)(see discussion above). WRAP (2009) suggests this food waste can be mapped along the six stages of the domestic food cycle - planning, shopping, storage, preparation, consumption and disposal (WRAP, 2009).

2.1.2. Factors affecting household waste

Four factors are often identified as having the most impact on the level of household food waste generated: household size and composition, income, demographics and culture (Parfitt, 2016). The impacts are therefore highly variable, depending on the context, with significant national and regional differences (HLPE, 2014).

Household size and composition

Several studies in the US (Van Guard & Woodburn, 1987) and the UK (Wenlock & Buss, 1977; Osner, 1982) show that household composition influences the amount of food wasted. Adults waste more than children, large families waste less per person than smaller families, single people waste more than those living as families, and households with children (depending on the age of the children) throw away less than those without children. Households with fewer occupants are likely to discard more as the products they purchase are typically larger than what they can consume (HLPE, 2014). From these studies, it was also noted that households with adolescents and young people were more likely to have higher wastage rates.

In terms of size, this COMCEC study identified that within the surveyed OIC Member Countries, the size of the household had a significant impact on the volume of food wasted, with some countries, such as Afghanistan and Senegal reporting to have households containing on average 10 family members.

Household income

The impact of household income on the generation of food waste varies. A few studies suggest that there are very few behavioral differences between affluent households and the less fortunate (Dowler, 1977; Wenlock et al., 1980; Jones, 2003). In contrast, several studies show that low income households waste less than those with higher incomes (Osner, 1982; Brook Lyndhurst, 2007). This correlation was also confirmed for Turkey (Pekcan et al., 2006), South Africa (Nahman et al., 2012) and Australia (Baker et al. 2009). Households with higher incomes discard more and is consistent with their greater food consumption, which is often seen as a symbol of prosperity (IMechE, 2013).

Household culture

Culture can partly determine household food waste. For example, Hispanic households in the US have lower food waste rates (approximately 25% less) than non-Hispanics. Studies also suggest they consume more fresh fruit and vegetables compared to non-Hispanic households (Parfitt et al., 2016). However, studies on this issue are scarce.

Within the context of culture social events, such as weddings and the stigma associated with taking food leftovers from restaurants home is explored further. This research identified these as particular cultural manifestations within OIC Member Countries that contribute to an increase in household and food service sector food waste.

2.1.3. Causes of household food waste

Research suggests that there are four main causes for food waste at home. These include:

- Poor planning of purchases,
- Confusion about date labelling,
- Poor storage or stock management, and
- Poor food preparation.

Poor planning of purchases

Poor planning for a food shop can result in over-purchase, whether improvised or food purchases bought too long in advance. This can lead to the purchase of excessive quantities of food, which can lead to food not being consumed in time leading to food waste (Bouzon et al., 2016; WRAP, 2007). This study reveals that most households in the surveyed OIC Member Countries do regularly adopt the use of shopping lists, and check their food stocks prior to food shopping. However, they all acknowledged that this still did not prohibit them from over-purchasing.

Consumers are often encouraged, through discounts or promotions, such as 'buy-one-get-one-free', to buy more than they need. This is a growing trend, with a third of grocery spend being on discounted products (WRAP, 2011a). Often when purchasing large quantities, shoppers do not look at use-by dates or do not calculate the amount of food they need. This over-purchase is a major cause of food waste, as not all food purchased can be consumed in time resulting in spoilage (France Nature Environment, 2013; WRAP, 2007; WRAP, 2011a).

It is also possible that when people purchase food less often i.e. bigger shops, food can lose its quality and deteriorate, resulting in food waste. Contrary to this is the ever day food shop which can lead to the purchase of too much or unnecessary food, which also deteriorates leading to food waste (HLPE, 2014).

The response to promotions within households from the surveyed OIC Member Countries suggests some variations in terms of the influence promotions have on shopping habits. For example, in Afghanistan, Cameroon and Turkey respondents indicated that promotions sometimes influenced their purchasing decisions, whilst in Uzbekistan the majority agreed that they were always influenced, and in Senegal, Saudi Arabia and Benin promotions have little sway.

Confusion about food date labelling

With an increasing tendency for consumption of processed foods, the extension of food chains and the dwindling of personal links between producers and consumers, consumers rely more and more on date labels to provide guidance on product freshness and shelf-life. Various studies in the US (NRDC, 2013), Europe (Bio Intelligence Service, 2010), UK (WRAP, 2011b) and Spain (HISPACOOP, 2012) highlight that food date labelling, and confusion about it, are a major cause of food waste. Confusion over date labelling and consumer misunderstanding of date labels accounts for a substantial part of household food waste (54%) in the UK (GfK, 2009; WRAP, 2009), and in France this confusion can result in approximately 7kgs per person per year of food waste (Garot, 2014).

Two main types of date label exist:

1) Date of expiry (DLC), and
2) Deadline for optimal use (DLUO).

The differences between the two are explained in Table 9, and reflect their use in the EU.

Table 9: Two types of date labeling used in the European Union

Date label	Representation on the label	Meaning
Expiry date (DLC) Usually used on high perishable products e.g. meat, fish, eggs and dairy	'Use-by' accompanied by the day and month e.g. use by18/02	Beyond the specified date, the product cannot be sold or consumed as it could lead to food toxicity
Deadline for optimal use (DLUO) Usually used on products that are moderately or less perishable The label informs the consumer about the time beyond which the organoleptic qualities and nutritional product may deteriorate	'Best before' accompanied by the day and month. e.g. to be consumed best before 18/02	For food with a shelf life less than 3 months
	'Best before' accompanied by month and year e.g. to be consumed best before the end of May 2016	For food with a shelf life between 3 and 18 months
	'Best before' accompanied by the year e.g. to be consumed best before end 2016	For food with a shelf life greater than 18 months

Source: ALEC (2014)

The date mark 'best-before' relates to food quality and indicates the date until which the food retains its specific properties when properly stored. 'Use-by' relates to food safety. From a microbiological perspective foods are highly perishable and are therefore likely - after a short period - to become an immediate danger to human health. A product with a 'use-by' date cannot be sold after that date.

According to Garot (2014), products with 'best-before' dates are thrown away by consumers thinking the date is a 'use-by' date, and if consumed after the date on the label the food constitutes a risk to their health. Fresh products with 'use-by' dates also trigger high food wastage, as consumers often do not store the food properly leading to a quick deterioration and it needing to be thrown away.

Date labelling is likely to also influence the volume of product thrown away in the OIC Member Countries. This is indicated by most householders surveyed stating they frequently check expiry dates when shopping, and some of the main reasons for discarding food at home are related to concerns about food no longer being safe to eat (e.g. worries about food poisoning), maintaining food freshness, and food reaching its expiry date (the latter is the predominant reason given for all surveyed OIC Member Country respondents).

Poor storage or stock management

A major reason for food waste in households is due to the inadequate use of fridges or cool storage (FUSIONS, 2014). Improper food storage and little attention to the instructions stated on labels (storage conditions vary depending on the climate and the temperature at home) and inadequate packaging and use of materials affect the healthy preservation of food and reduce the consumption period (WRAP, 2015; WRAP, 2010; WRAP, 2008). This is particularly the case in rural and more deprived regions where domestic refrigerators are more dated and less efficient and traditional techniques are still the norm for domestic storage of all but the most perishable products (Themen, 2014).

Optimal storage conditions can significantly extend the edible life of products, often beyond expiry dates. Airtight containers, for example, easily maintain the quality of dry foods such as fruits, nuts, rice, pasta, beans and grains over long periods. Over-stocking of food or lack of space had minimal impact on food waste generation in the surveyed OIC Member Country responses.

Portion control and poor food preparation techniques

According WRAP (2009), 41% of food wasted in households can be attributed to cooking too large a quantity leading to not all food cooked being eaten. Poor food preparation techniques can also lead to food waste. This can be due to a lack of knowledge on how to cook food properly e.g. making the most of leftovers in meals or how to prepare food properly e.g. using as much of the food as is possible, or cooking so it is edible (HLPE, 2014).

Another dimension of portion control are the portion size options offered by retailers. Large packs and bulk offers are a major cause of food waste at home (FUSIONS, 2014; European Commission 2010). Consumers, particularly those in smaller households, wanting smaller pack-size options are often forced to buy large packs (HISPACOOP, 2012; WRAP, 2008). In the UK, many consumers expressed concerns about pack-size options and formats being too big in relation to their needs.

Within the surveyed OIC Member Countries, most households expressed that cooking from scratch (home-cooked meals) was their preferred meal-choice option, with few ordering take-aways or cooking frozen meals.

Food subsidies

Within a few OIC Member Countries, e.g. Iran and Egypt, bread is subsidized. This subsidization has led to an increase in bread waste due to its low cost or too many loaves being handed out and not eaten (Shahnoushi et al., 2013). The impact of these bread subsidies is covered further in the report.

2.2. Food service sector food waste

Worldwide, food consumption outside the home is a growing phenomenon that is rapidly gaining importance due to its impact on both consumers and the food system. In the EU, it has been estimated that approximately 12% of total food waste originates from the food service sector (FUSIONS, 2016), or 21kgs per person per year (WRAP, 2013), or an average of 167g per person per meal for communal catering, and 211g per person per meal for commercial restaurants (MAAPRAT, 2011).

2.2.1. Definitions

The food service (hospitality) sector comprises of businesses and people engaged in preparing meals and drinks for consumption outside of the home (FUSION, 2016). The sector is divided into the private (profit) and public (cost) sectors (WRAP, 2011).

The private sector comprises of businesses primarily trading in catering and or providing accommodation with the objective to maximize profits – the four largest market outlets being quick service restaurants (QSRs), restaurants, hotels and pubs. The private sector also includes guesthouses, bed & breakfasts and youth hostels. The public sector differs in that hospitality is not the primary function and profit is not the main driver and service provision is the over-riding objective e.g. catering and accommodation services within the premises of schools, hospitals, prisons, military facilities etc (WRAP, 2011) (see Table 10).

Table 10: Food service sector types

Sub-sector	Definition	Examples
Private sector		
Restaurants	Outlets which have table services and where the consumer generally pays on departure	Italian, Chinese, Indian, bistros, fine dining
Quick Service Restaurants (QSRs)	Outlets which may have take-away or eat-in, or both, and where the consumer generally pays when purchasing food or drink	Fast foods, cafes, take aways, fish and chips shops, sandwich bars, pop-up outlets
Pubs	Outlets which focus on providing alcohol. Food sales are less than 50% of turnover	Pubs (tenanted, managed branded, managed unbranded), wine bars, nightclubs
Hotels	Outlets which provide overnight accommodation and where food accounts for less than 50% of turnover	Hotels, bed & breakfasts, youth hotels, caravan parks

Leisure	Outlets which are in places where leisure services are the prime focus of activity. Outlets may include restaurants, quick services or pubs	Museums/galleries, theatres, cinemas, sports clubs, event and mobile caterers, on board travel, motorway service stations
Staff catering	Feeding employees at the place of work including government locations as well as business and industry	Self-run or contracted canteens, staff restaurants
Public sector		
Healthcare	Outlet whose focus is providing healthcare (including short- and long-stay care)	Private and public hospitals, care and nursing homes
Education	Outlets which are primarily concerned with educating children or adults (or both)	Nursery, primary and secondary schools; further and higher education establishments
Services	Outlets which provide a publicly-funded service which are not healthcare or educational establishments	Prisons, armed forces; police and fire service catering

Source: WRAP (2013)

2.2.2. Causes of food service waste

The food service sector is very diverse and stakeholders have significantly different characteristics. This makes it a challenge to identify all the explanatory factors for food waste in the sector. However, referring to studies on the issue (FUSIONS, 2014; Carlsson-Kanyama, 2004; WRAP, 2013; MAAPRAT, 2011; Pirani & Arafat, 2015; Beretta et al., 2013; Mena et al., 2014; Goggins and Rau, 2015; Papargyropoulou et al., 2014; Sustainable Restaurant Association, 2010; BSR, 2014; Parfitt et al., 2010), the causes can be synthesized into three main categories:

- Preparation waste,
- Consumer leftovers, and
- Management of surplus food.

Meal preparation

Poor meal preparation is said to contribute 45% to the total amount of food waste generated in the food service sector (MAAPRAT, 2011). This includes waste produced during food preparation, over-production, peeling, cutting, expiration, spoilage and overcooking (SRA, 2010). The primary driver is the difficulty of estimating and calculating the correct amount of food to cook, due mainly to the complexity of predicting consumer expectations as well as forecasting demand (European Commission, 2010). The difficulty of anticipating the number of customers leads to over-stocking food and food waste (WRAP, 2013a).

Most of the surveyed OIC Member Country food service sector respondents agreed that most food waste is generated at the preparation stage, with some suggesting this is due to a lack of accurately knowing the numbers to be served.

In healthcare, upstream food waste is related to a wide variety of nutrient profiles to meet the need to provide sufficient calories, depending on the patient. In schools, food waste is often

attributed to preparing too much food and the lack of skilled kitchen staff. In commercial food services, food waste is linked to inventory management, requirements to use fresh quality ingredients, adherence to strict safety rules and professional practices in the kitchen (MAAPRAT, 2011; Papargyropoulou et al., 2014).

Customer leftovers

Approximately 34% of food waste is generated in this manner (MAAPRAT, 2011). Leftovers from consumer plates is mainly attributed to large portions being served, resulting in food not being eaten. This is particularly the case for buffets[1], which usually involves the preparation of a larger amount of food than is necessary, and customers filling their plates with more food than they can consume (European Commission, 2010; Pirani & Arafat, 2015; SRA, 2010; WRAP, 2013).

The food service sector respondents in this study overwhelmingly agreed that customer leftovers contributed significantly to their food waste, with establishments in Uzbekistan, Turkey, Senegal, Cameroon, Benin and Afghanistan all stating that less than 15% of their customers take home leftovers. The outlier being Saudi Arabia, with 40% of establishments stating over 70% of their customers take home leftovers. One of the main reasons to emerge from this research, and to explain this practice, is the stigma associated with taking home leftovers.

In healthcare, factors such as the interruption of meals due to medical appointments, presentation and the taste of food, reheating, physical difficulties of feeding (elderly or temporarily disabled), mismatched portions to the needs and wishes of patients or residents, and cultural or personal preferences can lead to food waste.

Management of surplus food

It is estimated that approximately 21% of food waste arises due to spoilage (MAAPRAT, 2011). Food deterioration is regarded as a main driver behind food waste in the food service sector as the knowledge about expiration dates – especially for food exposed to the open air – is limited. At this level, waste is related to confusion about 'best-before' and 'use-by' dates or other date information on packaging such as the EU wide ban on the use of animal by-products (ABP).

Inadequate storage is also an issue and is mainly due to caterers preparing hot food, which is difficult to store for later use. In addition, issues with some restaurants or countries not allowing customers to take home leftovers can also lead to increases in food waste (WRAP, 2013a; WRAP 2013b).

The EU FUSIONS project classifies food waste drivers by context to explain food waste in the food service sector, as highlighted in Table 11.

[1] A buffet is a meal consisting of several dishes from which e.g. restaurant customers or hotel guests serve themselves.

Table 11: Classification of food service food waste drivers by context categories

Context categories		Causes
Technological		• Storage • Equipment and containers • Lack of good practice
Institutional	**Business and economy**	• Difficulty to estimate and calculate the right amount of food to cook (related to consumer preference for wide assortment of products) • Consumer expectations prediction and demand forecasting • Inflexibility in portioning • Situational reasons 'food being served but not eaten' • Operational reasons 'food being prepared, but not served'
	Legislation and policies	• Ban on feeding ABP and catering waste to animals • Expiry dates (insufficient information in labelling)
Social (consumer behaviors and lifestyles)		• Behavior/attitude • Consumer preference

Source: FUSIONS 2014

2.3. Environmental impact

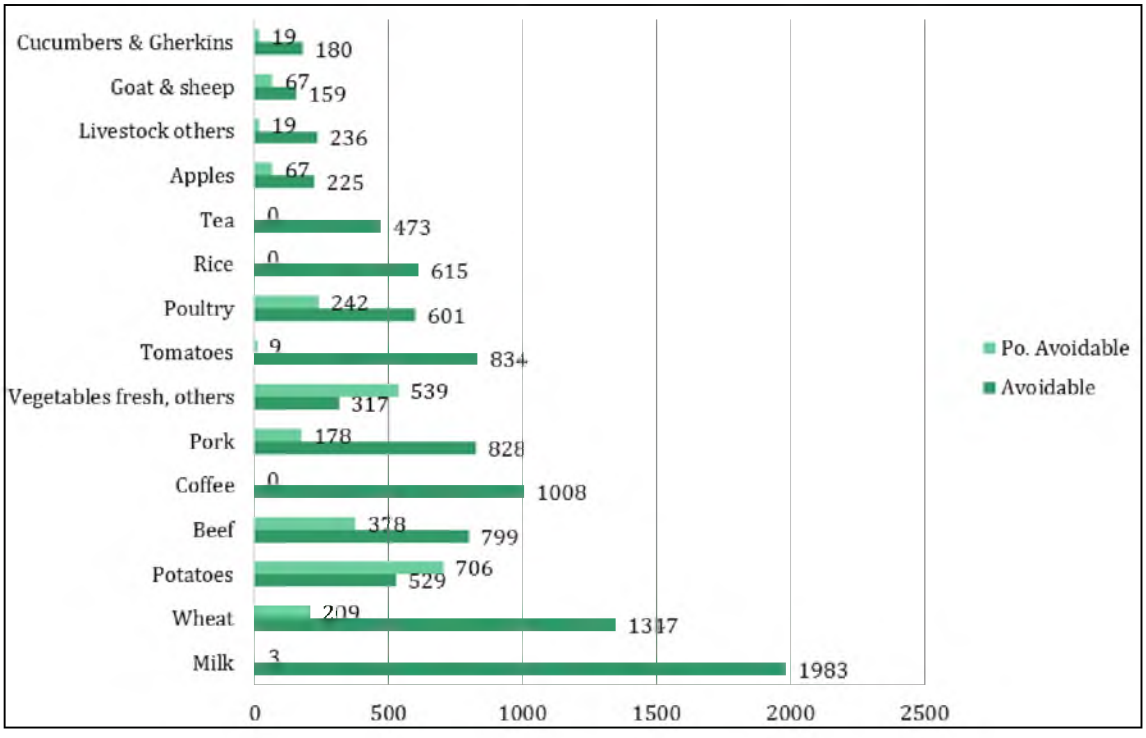
Food waste has very significant impacts on the environment as it is accompanied by a waste of resources (e.g. land, water and energy) and pollution (poor use of fertilizers and pesticides, methane production in landfill) associated with the production of food. This waste results in the needless use of resources used to produce the food wasted.

In 2013, the FAO published the 'Food wastage footprint' (FAO, 2013) report, which provides a global account of the environmental footprint associated with food waste. The study focused on climate, water, land and biodiversity impacts, and estimated the carbon footprint of food produced and not eaten as 3.3 giga tonnes of CO_2 equivalent. If a country, global food wastage would rank as the third highest emitter after the US and China (FAO). In the UK, CO_2 emissions associated with food waste is approximately a fifth of total UK emissions (DECC, 2010).

The highest carbon footprint of food waste occurs at the consumption phase (37% of the total), whereas consumption only accounts for 22% of total volume. This is due to the energy used for cooking, but also includes energy used for growing, storing, processing, distributing and disposing food. On average consumer waste is equivalent to eight times more energy 'waste' than post-harvest waste (Dobbs et al., 2011).

WRAP estimates that 78% of the household food waste CO_2 footprint is avoidable and 22% possibly avoidable. The average carbon footprint of avoidable household food waste is 330kg CO_2 per person per year, which is equivalent to approximately one third of emissions associated with household electricity use per person in the UK (WRAP, 2011) (see Figure 12).

Figure 12: Total carbon footprint of household food waste in the UK, by food type, per person per year

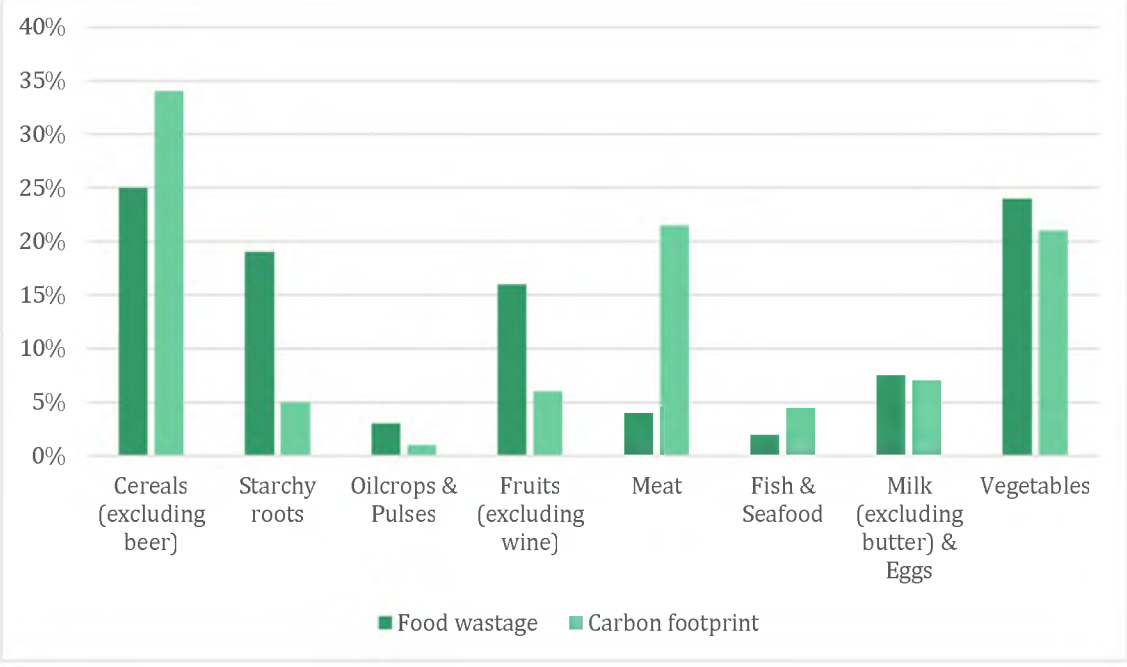


Source: WRAP, 2011

The main commodities contributing to the carbon footprint are cereals (34%), meat (21%) and vegetables (21%). Combined products of animal origin account for about 33% of the total carbon footprint, yet only 15% in volume (Figure 13). The high CO_2 factor can be attributed to the water and energy used to grow animal feed.

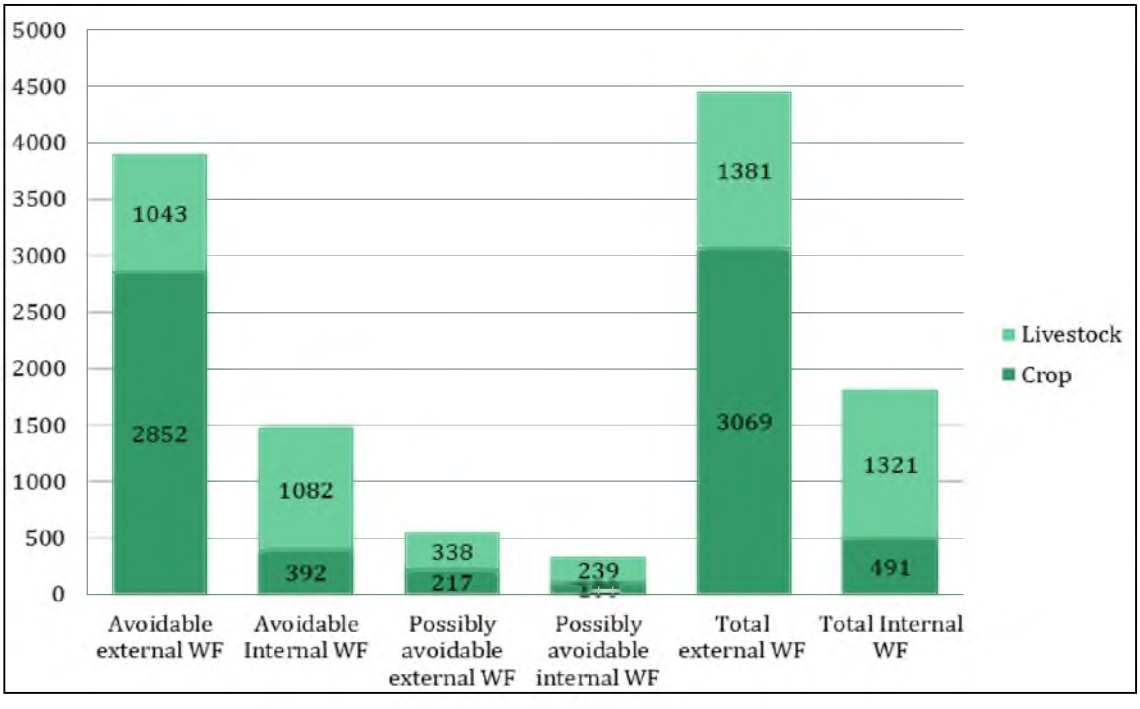
Wasted food is also wasted water. Water loss accumulates as food is wasted before and after it reaches the consumer. Calculations estimate that food waste accounts for more than a quarter of total freshwater consumption globally. To meet the current food demand, more than 3,000 liters of water per person per day are used in crop production (BSR, 2011). The water footprint is an indicator of freshwater use that looks not only at the direct water use of a consumer or producer, but also at the indirect water use, and is defined as the volume of freshwater used to produce a product over the full supply chain (Hoekstra & Chapagain, 2008). Globally, the water footprint for agricultural production associated with food waste is about 250km^3 (FAO, 2013), which is more than 38 times the water footprint of US households (Mekonnen & Hoekstra, 2011). In per person terms, the water footprint of total avoidable and possibly avoidable household food waste in the UK is 284 liters per person per day, while the daily average household water use in the UK is about 150 liters per person per day. 86% is associated with avoidable food waste (WRAP, 2011) (see Figure 14).

Figure 13: Contribution of each food type to food wastage and CO_2



Source: FAO, 2013

Figure 14: The water footprint of meat and crop household food waste, per year



Source: WRAP (2011)

Energy associated with food waste can be significant. For example, in the US food waste represents the energy equivalent of 350 million barrels of oil per year. This is enough to power the whole country for a week (BSR, 2011). Table 26 below illustrates some equivalents to demonstrate the energy impact associated with food waste.

Table 12: Comparison of the energy impact of food waste and daily activities

Wasting a loaf of bread equates to:		Wasting a beef steak equates to:	
Driving a car for	3km	Driving a car for	5 km
Lighting a lamp (60 W) for	32 hours	Lighting a lamp (60 W) for	70 hours
Running a dishwasher	2 times	Running a dishwasher	4 times

Source: Adapted from Bouzon et al. (2016)

2.4. Economic and social impact

The cost of food waste incorporates the cost of agricultural production and land, supply chain and retail costs, and treatment and disposal. According to the FAO, the direct economic consequences of wasted agricultural products (excluding fish and seafood) is estimated at US$750 billion per year globally (based on producer prices) (Gustavsson et al., 2011). At the household level, many regions and countries have reported the value of food thrown away e.g. an individual is said to throw US$528 of food away each year (France Nature Environment, 2010) and in Belgium US$230. Statistics South Africa (2011) estimate that post-food waste costs about 0.7% of the country's total GDP. This includes edible food waste that could be used to feed the poor.

In addition, economic losses should be compensated by the actors of the food supply chain, which may have an impact on food prices with the cost often transferred to consumers. Food waste can impact on food prices (Ruttan, 2013) and contribute to more strained commodity markets (for example HLPE, 2011 & 2013), and therefore an increase in food prices, which raises concerns about the impact on poor people.

In an annual assessment of global hunger in 2013, the FAO reported that that "the world produces enough food to feed everyone", yet at the same time an estimated one in eight people suffer from chronic undernourishment. The causes of hunger and malnutrition are complex and cannot be directed at food waste entirely. Nevertheless, food waste does result in a decrease in food availability and access, and compromises food security at a community and household level (HLPE, 2014). According to The Economist Intelligence Unit, food waste has a moderately strong relationship with overall food security (EUI, 2014).

3. OVERVIEW OF FOOD WASTE IN THE OIC MEMBER COUNTRIES

Research conducted for this study indicates that most data available on food waste for OIC Member Countries is recorded for post-harvest and the processing of products, with little attention to the consumer phase[2]. The aim of this section is to establish an estimate and sense of food waste in the OIC Member Countries at the household and food service levels. This section is based on a literature review and information collected from cases studies, and regional and individual country studies on food waste in the OIC Member Countries. More in-depth household and food service data is provided further on in the report, from case studies and survey data gathered for Afghanistan, Benin, Cameroon, Saudi Arabia, Senegal, Turkey and Uzbekistan.

3.1. An overview

According to SIK (2013) estimates for household and food service food waste in the main regions of the world where OIC Member Countries are located are:

- South and Southeast Asia: 25 million tonnes per year
- North Africa, West and Central Asia: 15 million tonnes, and
- Sub-Saharan Africa: 5 million tonnes.

The highest wasted products are roots & tubers, and fruits & vegetables for Sub-Saharan Africa; cereals and fruit & vegetables in North Africa, Central & Western Asia, and cereals and meat in South & Southeast Asia. Expressed as a percentage of total food waste in all stages of the food supply chain, consumption waste contributes:

- 15% in North Africa, Central & Western Asia,
- 9% in South & Southeast Asia, and
- 4% in Sub-Saharan Africa.

As a percentage of the total food chain, meat (30%) and cereals (29%) are the most wasted in North Africa, Central & Western Asia, fruit & vegetables (9%) and meat (6%) in Sub-Saharan Africa, and fruit & vegetables (13%) and meat (16%) in South & Southeast Asia (see Table 3.1).

Table 13: Total food waste, by region and commodity, per year

Food types	Sub-Saharan Africa		North Africa, Central & Western Asia		South & Southeast Asia	
	Tonnes (million)	% of total food chain	Tonnes (million)	% of total food chain	Tonnes (million)	% of total food chain
Cereals	0.8	4%	7.6	29%	9	10%
Roots & tubers	1.3	2%	0.7	16%	1.4	4%
Oilseeds & pulses	0.2	4%	0.2	10%	0.5	2%
Fruit & vegetables	2.2	9%	4.3	9%	11.8	13%
Meat	0.2	6%	0.9	30%	0.8	16%
Fish & seafood	0.0	0%	0.0	0%	0.2	5%
Milk & eggs	0.0	0%	1.0	9%	1.2	4%
Total	**5**	**4%**	**15**	**15%**	**25**	**9%**

Source: Adapted from SIK (2013)

[2] This is corroborated in other food waste research e.g. A study by Elmenofi et al., (2015) *An exploratory survey on household food waste in Egypt*, which states that there is few data regarding food waste in Egypt.

In terms of total food purchased by households in North Africa, Central & Western Asia, 12% of cereals and 5% of fruit & vegetables are wasted. For Sub-Saharan Africa and South & Southeast Asia the largest contributors are fruit & vegetables (5% and 7% respectively) (see Table 14).

Table 14: Total food purchased by consumers that is wasted, per year

Food types	Sub-Saharan Africa	North Africa, Central & Western Asia	South & Southeast Asia
Cereals	1%	12%	3%
Roots & tubers	2%	6%	3%
Oilseeds & pulses	1%	2%	1%
Fruit & vegetables	5%	12%	7%
Meat	2%	8%	4%
Fish & seafood	2%	4%	2%
Milk & eggs	0.1%	2%	1%

Source: Gustavsson et al. (2011)

3.2. Household food waste

The issue of household food waste in OIC Member Countries has been investigated, in addition to this study, in some individual, regional and sub-regional studies.

A study for selected Mediterranean Arab countries (Algeria, Egypt, Morocco, Lebanon and Tunisia) focused on bread and bakery products waste (Capone et al., 2016). This study was based on a review of data from different sources as well as the results of an online exploratory survey on household food waste in Mediterranean countries carried out by the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM-Bari).

Results from the survey show that household food waste is widespread in all countries. The quantity of food thrown away per week depends on different factors e.g. household composition and time of year. The most wasted food types are cereals and bakery products, and fruits and vegetables. In general, perishable products are the most wasted (see Figure 15).

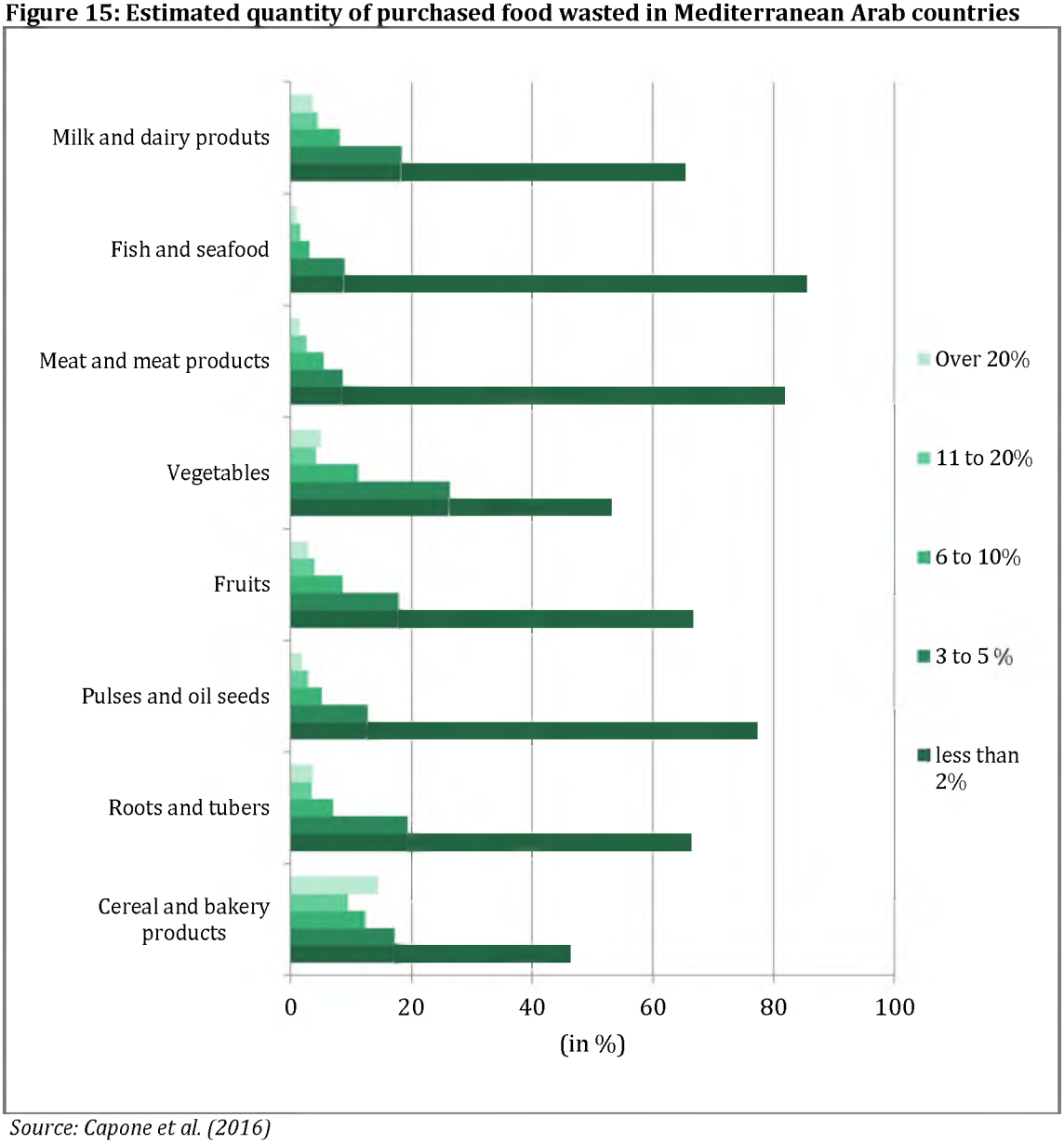
Capone et al's (2016) study also estimates the economic value of food wasted each month (see Table 15). Most households in the country of study wasted less than US$5 per month, except for Lebanon, with most Lebanese households wasting an estimated US$ 6-20 per month. It should be noted that the economic value of household food waste depends on household composition, food habits and consumption patterns.

Table 15: Value of food wasted by households, by country

Countries	Less than US$ 5	US$ 6-20	US$ 21-50	More than US$ 50
Algeria	52%	40%	6%	2%
Egypt	79%	15%	6%	1%
Lebanon	20%	54%	19%	7%
Morocco	46%	43%	11%	1%
Tunisia	57%	36%	5%	1%

Source: Capone et al. (2016)

Figure 15: Estimated quantity of purchased food wasted in Mediterranean Arab countries



Source: Capone et al. (2016)

A 2015 study by Elmenofi et al. aimed to develop a general overview of food waste from households in Egypt. Data was gathered using an online survey, and face-to-face interviews. The results suggest that food waste is a concern, as approximately 86% of respondents acknowledged that they do throw away food. Foods most commonly thrown away are fruit and vegetables, cereals and bakery products. Most Egyptians spend a significant proportion of their salaries on food. 86% of respondents do worry about food waste and try to avoid it, with 52% indicated they dispose very little uneaten food. Over 40% of respondents indicated they feed food waste to animals, particularly those living in rural areas. Based on the findings, the authors recommend the urgent need to raise awareness among the Egyptian population and organisations about the food waste issue. In addition, it was felt that further research was

required to better understand food waste generated by the poorer or less educated strata of Egyptian society.

The six-member countries of the Gulf Cooperation Council (GCC) - Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and UAE - stand out among the world's top generators of food waste. Most GCC countries are unable to grow and rear all the food they need – this is due to a lack of arable land and access to fresh water sources. As such, they depend heavily on imported food to meet domestic food demands. The UAE, Bahrain, Qatar and Oman import over 90% of their food and rely heavily on desalination for their potable water needs (EAAD, 2014).

A review of residential solid waste (RSW) management in the occupied Palestinian Territory (Al-Khatib and Arafat, 2010) concluded that the main component of RSW was food waste, approximately 2,728 tonnes per day. In both the West Bank and Gaza Strip food waste accounted for about 81% of RSW (see Table 16).

Table 16: Food waste as contribution of total Palestinian Territory residential solid waste

Region	Food waste (%)
Palestinian Territory	81%
West Bank	78%
North of West Bank	74%
Middle of West Bank	76%
South of West Bank	88%
Gaza Strip	87%

Source: Al-Khatib and Arafat (2010)

In 2014, the FAO Regional Office for Europe and Central Asia carried out studies on food waste in Kazakhstan (Shortan, 2014) and Tajikistan (Nabieva, 2014). The studies aimed to identify critical points and patterns of food waste along selected food supply chains. Food waste is presented as percentages of food wasted at each stage. The results for consumption at the household level are shown in Table 17.

Table 17: Household food waste in Kazakhstan and Tajikistan, by food type

Kazakhstan		Tajikistan	
Cereals (wheat)	5-15%	Cereals (wheat)	2 %
Oilseeds and pulses (sunflower)	1-2%	Roots & tubers (potatoes)	4 %
Roots & tubers (potatoes)	5-15%	Vegetables (onions)	4 %
Meat (beef)	1-2%	Fruit (dried apricots)	0.1 %
Milk (cow's milk)	1-5%	Milk (cow's milk)	2 %

Source: Shortan (2014) and Nabieva (2014)

In Kazakhstan, the highest wastes are wheat and potatoes. This is explained by these products often having much lower prices and therefore less attention is given to the waste as a valued product. In Tajikistan, potatoes and onions are the highest wasted products. The main reasons being excess purchase; purchase of damaged, old or unusable produce; poor transportation and storage and plate waste. For dairy products (milk), waste is minimal as it is consumed in smaller quantities and is relatively expensive in relation to other food products. The most common reason for milk that is wasted is improper storage or expiry of 'use-by' dates.

The impact of socio-economic and demographic factors effecting household food waste was the focus for a study in Turkey. The study investigated food waste in the capital city, Ankara (Pekcan

et al., 2006). A sample of 500 households (1,736 individuals) were grouped by socio-economic status, including the age and sex of each household member, socio-demographic status, family size, educational and occupational status and income level.

The average daily food waste per household and per person was recorded as calories per day, and equated to 4,812kcal per household and 216kcal per person, which amounted for 9% of a person's daily dietary energy consumption. Lower socio-economic groups wasted less food than higher socio-economic households in terms of both weight and calories (Table 18).

Table 18: Household food waste in Turkey, by socio-economic group

	Socio-economic group		
	High	Middle	Low
Grams per capita per day (kg per year)	319g (116kg)	285g (104kg)	274g (100kg)
kcal per capita per day	140	146	125

Source: Peckan et al (2006)

These findings are confirmed by a recent study (Yildirim et al., 2016) which stressed that the amount and frequency of household food waste might be explained by a combination of factors, including behaviors and attitudes that depend on the life and working conditions of individuals. The study also highlighted the role of marketing, which often leads to the purchase of more products or larger quantities. Yildirim et al. (2016) therefore argues that food waste starts at the supermarket rather than at home. Other causes of food waste identified were storage of food in the fridge for too long, food damage and expiry, and date label confusion.

A study on household municipal solid waste (MSW) in Chittagong, the commercial capital city of Bangladesh, concluded that an average household generated 1.4kgs of solid waste per day, of which 72% was food (Abdus Salam et al., 2012). The high rate of food waste is explained by the population's consumption of large quantities of perishable green vegetables and homemade food which leads to an increase in the volume of peelings. An analysis of socio-economic bands showed that the lowest socio-economic group had the highest level of food waste in their household waste stream (89%), with the high socio-economic group having the lowest (53%). The higher figures for the lower socio-economic groups was explained by people living on the periphery of the city, and consuming less packaged products.

3.3. Food service sector food waste

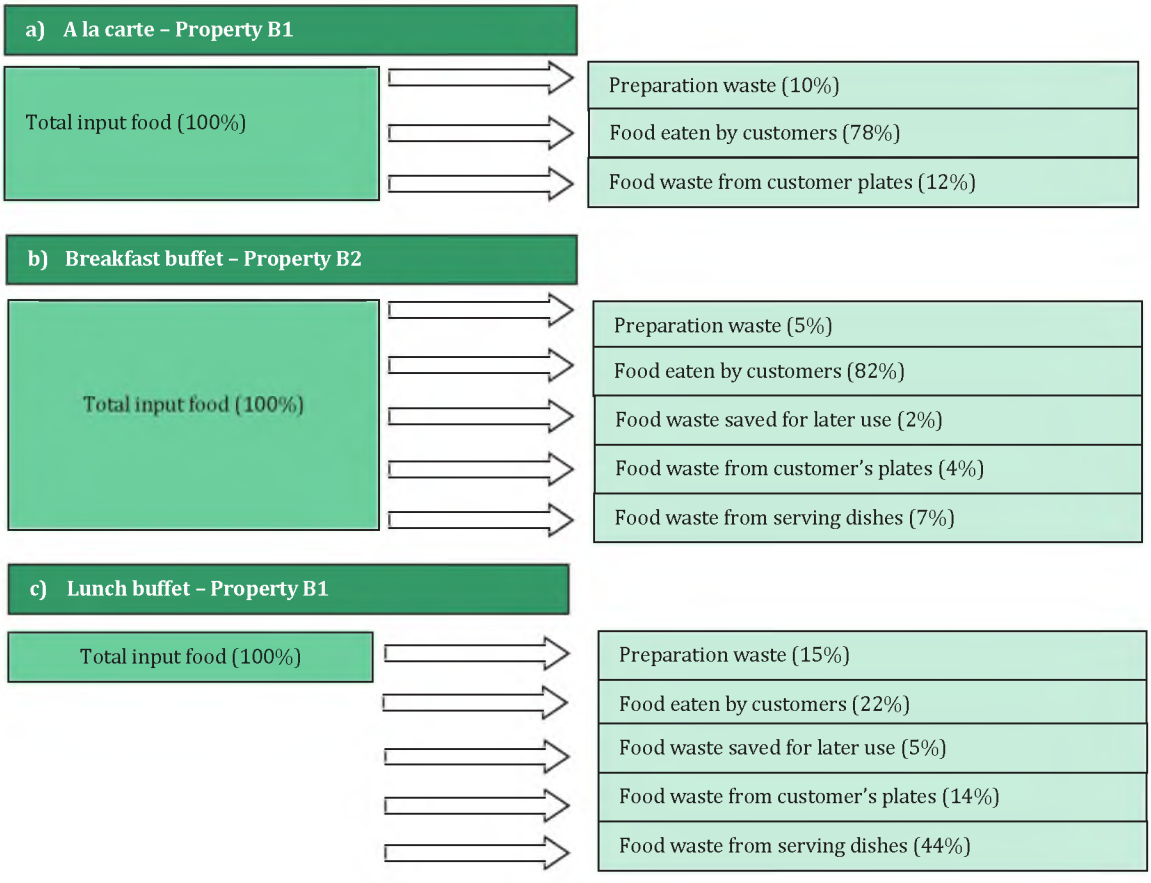
The food service sector in the OIC Member Countries is witnessing a steady growth, driven by economic growth, demographic changes (multicultural, young, expanding population), favorable consumption habits, an influx of tourists and rapid urbanization (Al Masah Capital, 2014). This growth is accompanied by an increase in food waste.

Unlike household waste, research into hospitality (or food service waste) is not as expansive for OIC Member Countries. However, a few studies were identified which provide an indication of food waste generated by the food service sector in the OIC Member Countries.

A recent study on food waste management in UAE hotels and restaurants in Dubai and Abu Dhabi (Pirani and Arafat, 2015) studied the materials flow of food to quantify the proportions

of food waste produced at the different stages of the food service process. According to this study, the amount of food waste is affected by many factors such as the style of service, type of food served, expected versus actual number of customers and the food service organization. Findings suggest that there is much variation in the amount of food wasted depending on the food service delivery mechanism e.g. *A la carte*, breakfast or lunch buffet (see Figure 16).

Figure 16: Food waste in the hospitality sector in UAE



Source: Pirani and Arafat (2015)

To ascertain and test how factors such as type of cuisine, food service style, meal times and customers, affected food waste generation, research was undertaken in a case study restaurant operating in a five-star hotel in Kuala Lumpur, Malaysia. The restaurant was selected as it provided full access for data collection, offered a mixture of cuisines and food service types (combination of buffet style and A *la carte*) for breakfast, lunch and dinner, and catered for a variety of customers (Papargyropoulou et al., 2016).

The restaurant generated, on average, 173kgs of food waste per day (63 tonnes per year). The study showed that the *A la carte* service produced more preparation and customer plate waste per customer compared to the buffet service. Table 19 shows the split per meal and service type, and food waste stage.

Table 19: Average food waste generated per customer, by food preparation and consumption stage

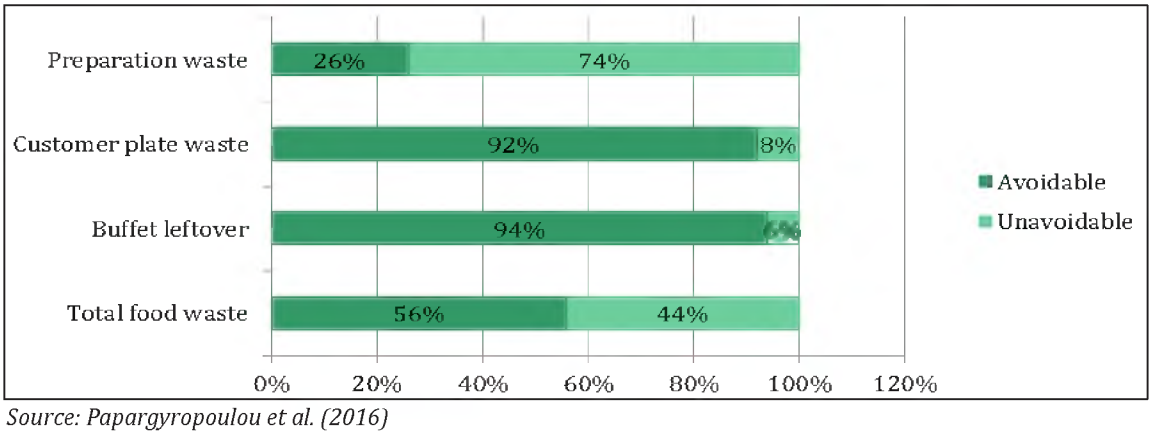
Food preparation and consumption stage	Breakfast buffet	Lunch *A la carte*	Lunch buffet	Dinner *A la carte*	Dinner buffet
	Per customer per day (g) and per year (kg)				
Preparation waste	600g (219kg)	800g (292kg)	600g (219kg)	600g (219kg)	500g (183kg)
Customer plate leftover waste	300g (110kg)	1,400g (511kg)	100g (37kg)	300g (110kg)	400g (146kg)
Buffet leftover waste	300g (110kg)	NA	400g (146kg)	NA	200g (73kg)
Total waste per customer	**1.2kg (438kg)**	**2.2kg (803kg)**	**1.1kg (402kg)**	**1kg (365kg)**	**1kg (365kg)**

Source: Papargyropoulou et al. (2016)

If the outlier of the lunch time *A la carte* service is excluded, the figures suggest that the buffet services were more wasteful than the *A la carte* service, as they produced substantial amounts of leftovers, making it a more wasteful type of service. This demonstrates how food wasted was affected by the type of service provided and food consumption practices of the customer. The same was found for the surveyed OIC Member Country food service establishments.

Another important feature of food waste generation was the percentage of avoidable and unavoidable food waste. 56% of all food waste generated in this study was avoidable, which shows the significant scope for food waste prevention. At the preparation stage, most food waste was unavoidable (74%) as it was comprised of mainly inedible parts of food e.g. egg shells. Buffet leftover waste was comprised mainly of edible food, with an avoidable fraction of 94%. Food waste from the customer's plate was a mix of inedible components, such as bones, seafood shells etc., and edible surplus food (see Figure 17).

Figure 17: Avoidable and unavoidable food waste



Source: Papargyropoulou et al. (2016)

Approximately 30% of purchased food was thrown away, of which 17% was generated during preparation, 7% as customer plate waste and 6% as buffet leftover waste. Vegetables, cereal and fruit represented the three most wasted food types. The findings from the UAE study correlate with a study of restaurant food waste undertaken by the University of Jordan (Al-Domil et al.,

2011), which recorded customer plate waste at no more than 10% of total food purchased (42kg out of 323kg).

From these examples, it cannot be assumed that all restaurants waste significant amounts of food. For example, a study undertaken in restaurants in Sana, Yemen revealed that little is wasted (Nasser, 2013). This is because restaurants find ways to cook and prepare food economically, and that most customers were keen to clean their plates and leave no leftovers.

3.4. Initiatives to reduce food waste

As highlighted earlier, the issue of reducing food waste has become a major preoccupation for international organizations, governments, Non-Governmental Organisations (NGOs) and civil society. The reports of the Arab Forum for Environment and Development (AFED) have frequently emphasized the importance of promoting better efficiency and fair access to food while reducing waste. In February 2014, the 32nd Session of FAO Regional Conference for the Near East on 'Reducing Food Losses and Waste in the Near East & North Africa Region' took place in Rome. The conference endorsed the 'Strategic framework for the reduction of Food Losses and Waste in the Near East and North Africa' with the main aim to reduce food waste in the region by 50% over the next 10 years. As such, many OIC Member Countries have now begun to address institutional priorities and practices to address food waste. A few of these initiatives are highlighted below. They do not reflect all activities, but illustrate the variety of initiatives being undertaken.

For example, in Morocco, the Ministry of Agriculture and Fisheries - in partnership with FAO - launched a project in 2015 to develop a national strategy and action plan to reduce food waste in the country. The main activity of this initiative is a study on food waste in the country for selected key food supply chains from which a vision and strategic direction will be developed to reduce food waste by 50%, by 2024 (Moroccan Ministry of Agriculture and Fisheries, 2014).

In Algeria, the National Union of Algerian Traders and Artisans, the National Consumer Protection Association and Ministries of agriculture, trade, health and all government and non-governmental organizations related to the topic of food waste are working together to raise consumer, producer and trader awareness on the quality of food products on the market. Due to the hot climatic conditions experienced in Algeria, and inappropriate cold chain management practices, large quantities of food waste are generated. As such, a campaign focusing on storage issue is run at the beginning of each summer with the aim of reducing food waste in the supply chain (Le Courrier de l'Algerie, 2015).

In Turkey, food waste associated with bread consumption is an issue. In response to this issue the Turkish Grain Board and the Ministry of Food, Agriculture and Livestock, launched the 'Do not waste your bread' campaign in 2013. The campaign was initiated following the publication of the 'Bread waste and consumer habits research' reports in 2008 and 2012 (Turkish Grain Board, 2008 & 2012). The objectives of the campaign are tailored for production through to consumption by raising awareness of the issue, identifying the potential contribution of waste reduction to support an efficient national economy, drawing attention to the fact that bread used for feeding animals is also considered a waste, and to promote the consumption of whole wheat bread for healthy diets.

A review of the campaign's achievement in 2013 reported the campaign had resulted in a waste reduction of 18% (an equivalent of 5.9 million loaves per day or 2.17 billion loaves per year).

The economic saving is equivalent to US$131 million, with 40% of the reduction recorded in households, staff and student dining halls.

3.4.1. Food banks

The role of food banks in the OIC Member Countries is significant, with many examples identified throughout all regions. Food banks are a response to high rates of poverty and hunger, food scarcity, food waste and the availability of food still fit-for-purpose but not consumed or purchased.

One of the first and most recognized food bank initiatives operates in Egypt, which aims to reduce food waste from hotels and restaurants by donating unused, safe, nutritious food to the needy[3], through its 'Not to Waste Food' program. The Egyptian Food Bank works in partnership with the Egyptian Hotel Association, who encourage the support and participation of more than 400 hotels and restaurants, ranging from five star hotels to local coffee shops. The program, initiated in 2005, donates more than 17 million meals each month. The success of the program has been attributed to its awareness programs for individuals, hotels and restaurants to reduce food waste. The campaign has expanded to households, encouraging the distribution of surplus, untouched food to the needy (Elmenofi, 2015, FBRN, 2014).

Following the success of the Egyptian Food Bank program, the UN Private Sector Forum committed, in 2010, to assist organisations in other countries to implement and adopt the Egyptian food bank model and programs in other countries. In 2012, the FAO promoted the cascading of this model and further recommended the promotion and exchange of knowledge, co-ordination and dissemination of good practice, adoption and support of success stories. In response to this the Arab Food Bank Regional Network (FBRN) was established in 2013 to replicate this model in the food service sector. Its aims are to eliminate regional hunger through establishing, developing and supporting food banks in the region in co-operation with a broad spectrum of partners, sponsors and members with a vision of a 'Region free from hunger by 2020'. The FBRN works at the regional and international level to unite and co-ordinate food and nutrition relief efforts. Their network of members includes the Saudi Food Bank Al khobar and Riyadh branches, Iraqi Food Bank, Tunisian Food Bank, Lebanese Food Bank, Jordanian Food Bank and Mauritanian Food Bank (FBRN, 2014).

[3] Approximately 16 million people live below the poverty line in Egypt (Elmenofi et al., 2015).

4. LEADING MOTIVATIONS FOR CONSUMERS TO REDUCE FOOD WASTE

4.1. Potential benefits from reducing food waste

Food waste has risen up the agenda of policy makers, researchers, business and civil society organisations as it can have a significant negative impact on food availability and security, the economy and environment. By reducing food waste more people can have access to food, the impact of the waste on the environment can be reduced with a correlated positive economic impact.

4.1.1. Improving food security and availability

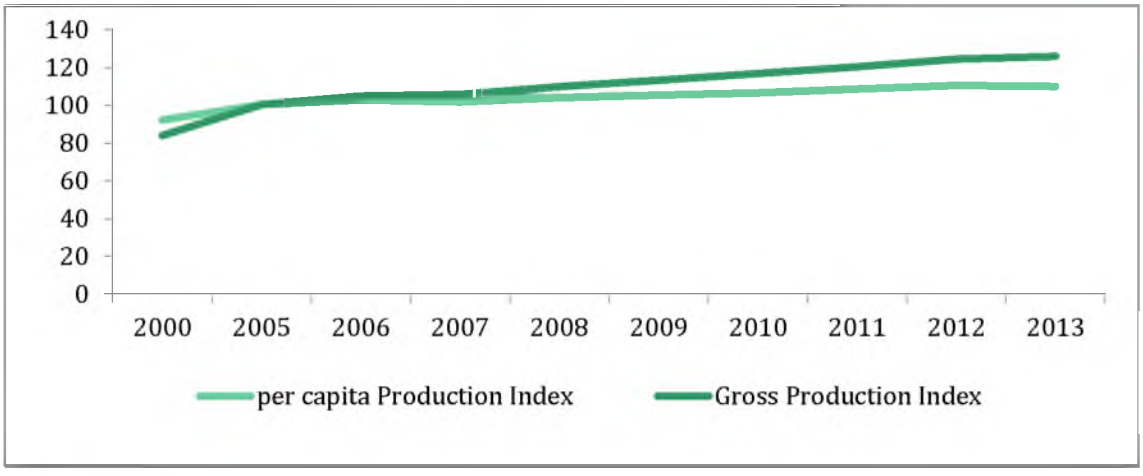
One of the key factors for reducing food waste is the availability and access to food within the context of world population growth (Buzby & Hyman, 2012). The global population could exceed nine billion by 2050 (UN, 2011) which requires, to ensure food security, an increase in global agricultural production of more than 70% (FAO, 2009). However, agricultural production is already limited by agronomic, climatic and social constraints. In contrast, some 795 million people in the world do not have enough food to lead a healthy active life (FAO, 2015). That is about one in nine people globally. Access to food is not a problem of supply, as the global food system can provide enough food to feed the world (UK Government Office for Science, 2011), it is more about access. One of the reasons for this disconnect is waste. To feed 9 billion people by 2050, to ensure people do not go hungry, and to safeguard food security, significant changes need to occur throughout the current food system, from crop management and harvesting, to processing and consumption. Reducing the amount of food that is wasted in the system represents one way to solve the current and expanding food crisis. It is estimated that by halving the current amount of food waste by 2050 the projected amount of food required to feed 9 billion people by 25% could be reduced (UK Government Office for Science 2011).

Food security in the OIC Member Countries

A recent study by the Statistical, Economic and Social Research and Training Centre for Islamic Countries (SESRIC) indicates that between 2000-2013 food production for OIC Member Countries was higher than the population growth, and above the world average (Figure 18). However, many OIC Member Countries are, on average, net food importers and unable to meet their food needs from locally grown or reared sources – with the per person food production lower than the world average[4]. This means these countries have insufficient food production capacity to meet the domestic demand for their growing populations and as such must rely heavily on food imports (SESRIC, 2016) (see Figure 19).

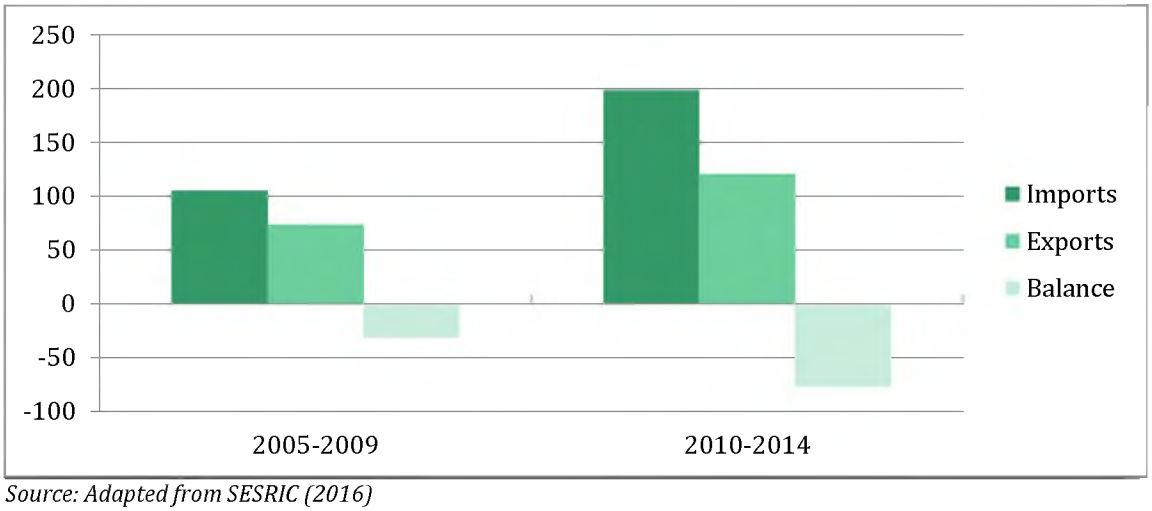
[4] This is the case for Afghanistan, Bangladesh, Benin, Burkina Faso, Cote d'Ivoire, Cameroon, Chad, Comoros, Cote d'Ivoire, Djibouti, Gambia, Guinea, Guinea-Bissau, Kyrgyzstan, Mali, Niger, Nigeria, Senegal, Sierra Leone, Somalia, Tajikistan, Togo, Uganda, Uzbekistan, Yemen.

Figure 18: Food production index for OIC Member Countries[4]



Source: SESRIC (2016)

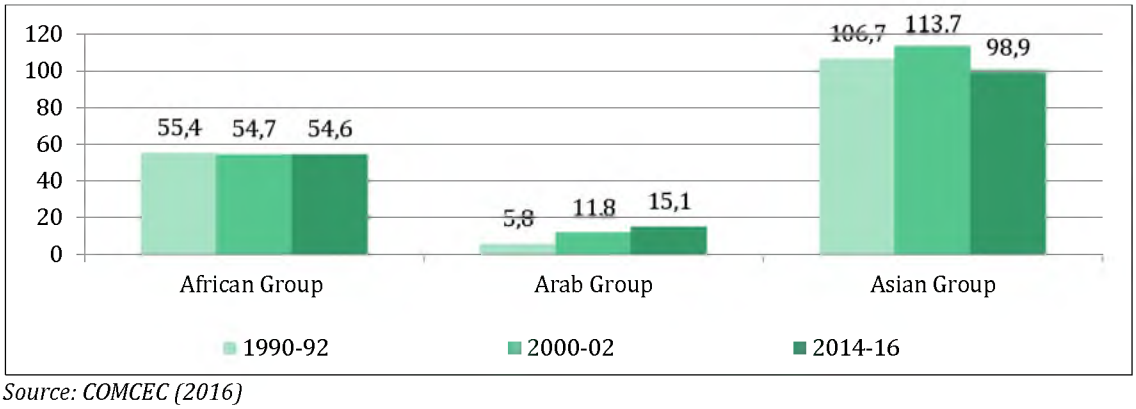
Figure 19: Food trade balance for OIC Member Countries (yearly average in US$ billions)



Source: Adapted from SESRIC (2016)

This situation is set within the context of food poverty. It is estimated that 168.6 million people were expected to be undernourished in the OIC Member Countries between 2014-16, approximately 15% of the population (COMCEC 2016). This is higher than other developing countries (14%) and the world average of 12% (SESRIC, 2016). The share of OIC Member Country populations categorized as undernourished against the world total has risen from 17% in 1990-1992 to 21% in 2014-2016. This can be explained by a surge in food insecurity, particularly after the food crisis in 2006-2008 (COMCEC, 2016c). At the sub-regional level, 98.6 million undernourished people in 2014-2016 are expected to live in the Asia Group region, which accounts for nearly 60% of the undernourished population in the OIC Member Countries (see Figure 20).

Figure 20: Representation of undernourished people living in OIC Member Countries, by region



Source: COMCEC (2016)

The deficit between locally produced food and high imports, and an above average undernourished population makes many OIC Member Countries vulnerable to any marked increase in international food prices and rising food import costs. An example of this is evidenced by countries in the Near East and North Africa (NENA) region who rely on food imports to meet over 50% of their total food requirements yet still experience a food deficit. At the same time, the region wastes a significant amount of food, up to 250g per person each year – higher than the global average. The region imports 36 million tonnes of wheat per year, yet it wastes over 16 million tonnes each year (more than US$6 billion). This wasted wheat could feed 70 to 100 million people (FAO/NERC, 2014). The same is witnessed in the OIC Member Countries in sub-Saharan Africa, where approximately 25% of the population does not have physical and/or economic access to enough food to sustain a healthy life, whereas food waste contributes to at least a 15% decrease of saleable volumes of food for 470 million smallholder farmers, and negatively affects 290 million downstream agricultural processing workers and their families (The Rockefeller Foundation, 2013).

These examples clearly illustrate that by reducing food waste an opportunity to improve food availability, quality, safety and affordability for those less prosperous individuals is very real. If food waste is not addressed, it can have serious implications, such as rising food prices. A reduction in food waste can lead to more domestic food availability for households, can stimulate agricultural growth, enhance food security and reduce dependence on and vulnerability to changes in the world food market prices, thereby decreasing rural poverty (Rutten & Kavallari, 2013).

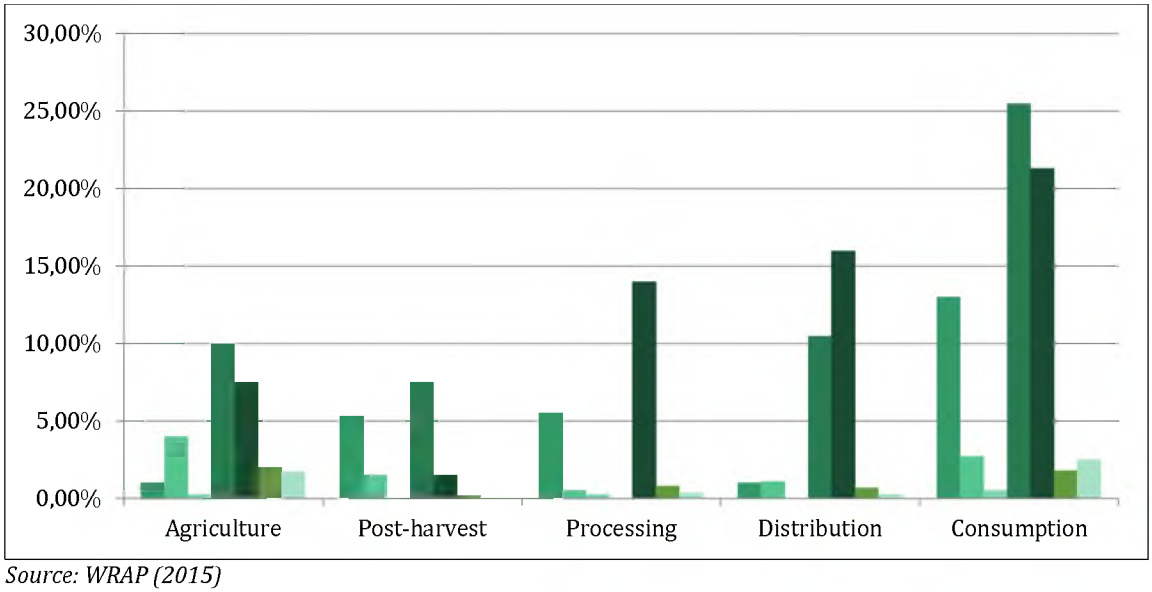
4.1.2. Reduced environmental impact

As highlighted previously the environmental impacts associated with food waste represents significant losses of resources invested throughout the food supply chain to produce, collect, store, transport, process and sell food (Buzby et al, 2011). WRAP (2015) suggests that a 20–50% reduction in global food waste could realize savings of between 55 to 140 million tonnes of food per year (based on 2011 waste levels). With a predicted rise in the middle classes, they estimate this saving could increase to 110–280 million tonnes of food.

The potential Greenhouse Gas emission (GHG) savings associated with this saving could reach between 220 million-1 billion tonnes CO_2eq. Within the context of OIC Member Countries, if food

waste was reduced by 20% in Industrialized Asia and South and Southeast Asia an estimated 250-150 million tonnes CO_2e could be avoided, and 360-630 million tonnes CO_2e if 50% of food waste could be avoided (see Figure 21).

Figure 21: GHG emissions avoided if a 20% reduction in food waste was realized in industrialized Asia



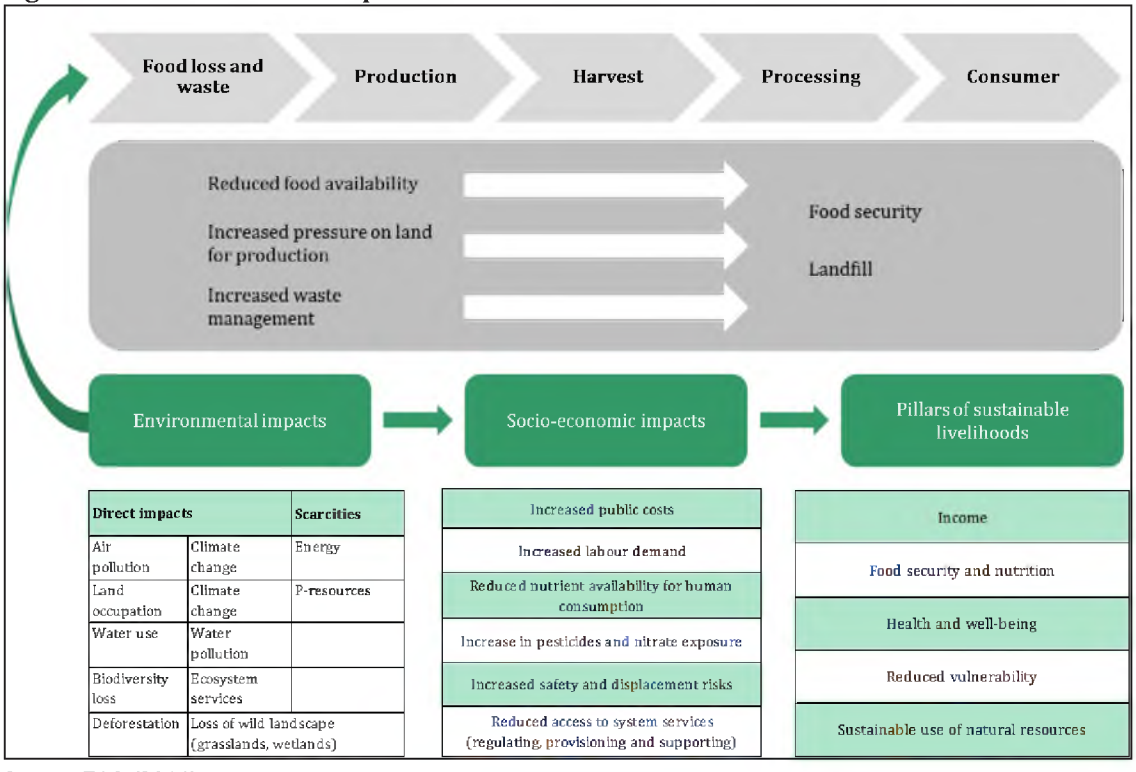
Source: WRAP (2015)

Reducing food waste is critical for countries that face limited possibilities to increase their food production, and who depend on food imports to meet their food needs, such is the case for most OIC Member Countries. The inability to supply food to meet the needs of many OIC country populations is due to the low percentage of agricultural land used to grow crops and rear animals. The total average cultivated area in the OIC Member Countries is 26%. This is lower than the average for other developing countries (33%) and the world (31%)(SESRIC,2016). This is possibly due to many OIC Member Countries being arid and therefore not conducive for agricultural production. In addition to the restricted availability of arable land, water is a scarce resource in many OIC Member Countries, particularly those in West Asia, the Middle East and North Africa. Pressures on limited water supplies are expected to increase with increased population growth and increased water use as countries become more developed. These natural resource constraints can be eased by reducing food waste and therefore reducing the demands to increase locally-grown or reared food.

A more holistic option tabled for strengthening the food supply chain, including a reduction in food waste, and enhancing food availability is through the adoption of sustainable food systems (HLPE, 2014). 'Sustainable food systems' are defined by their ability to produce the expected positive results of a food system, namely food security now and for future generations. The three dimensions of sustainability (environment, social and economic) interact with the four dimensions of food security (availability, access, utilization and stability). A recent study published by the FAO (2014) suggests a reduction in food waste could improve the sustainability of food systems, which would have a positive impact on the economic, social and environmental benefits that would offset the costs of implemented measures to prevent food waste. Food waste

prevention would increase the availability of food for human consumption, enhance the efficiency of food systems and reduce resource use and GHG emissions. Figure 22 illustrates the potential positive socio-economic impacts associated with a reduction in food waste (reflected as pillars of sustainable livelihoods).

Figure 22: Socio-economic impacts and benefits associated with reduced food waste



Source: FAO (2014)

Reduced food waste does not only help to increase the supply of food demanded by a growing population but also produces less GHG emissions (FAO, 2014; SDSN, 2013; WRAP, 2015,), improves resource efficiency and long-term food security (Tielens and Candel, 2014).

4.1.3. Financial and economic benefits

Using the principal of supply and demand, Rutten et al. (2013) suggest that reductions in food waste may improve food security and hunger as food prices are lowered and food consumption is increased. This is elaborated further in a study on the impacts of reducing food waste by households and retail in the EU (Ruttan et al., 2013), which concluded that by reducing food waste households could save €92 per person per year, with a 30% reduction in household waste by 2020 or €150, with a 50% reduction by 2020. This amounts to an annual saving of €56.6 (30% reduction) or €94.4 billion (50% reduction) for the EU in total. This represents an annual saving of 5% to 9% on the household budget per year.

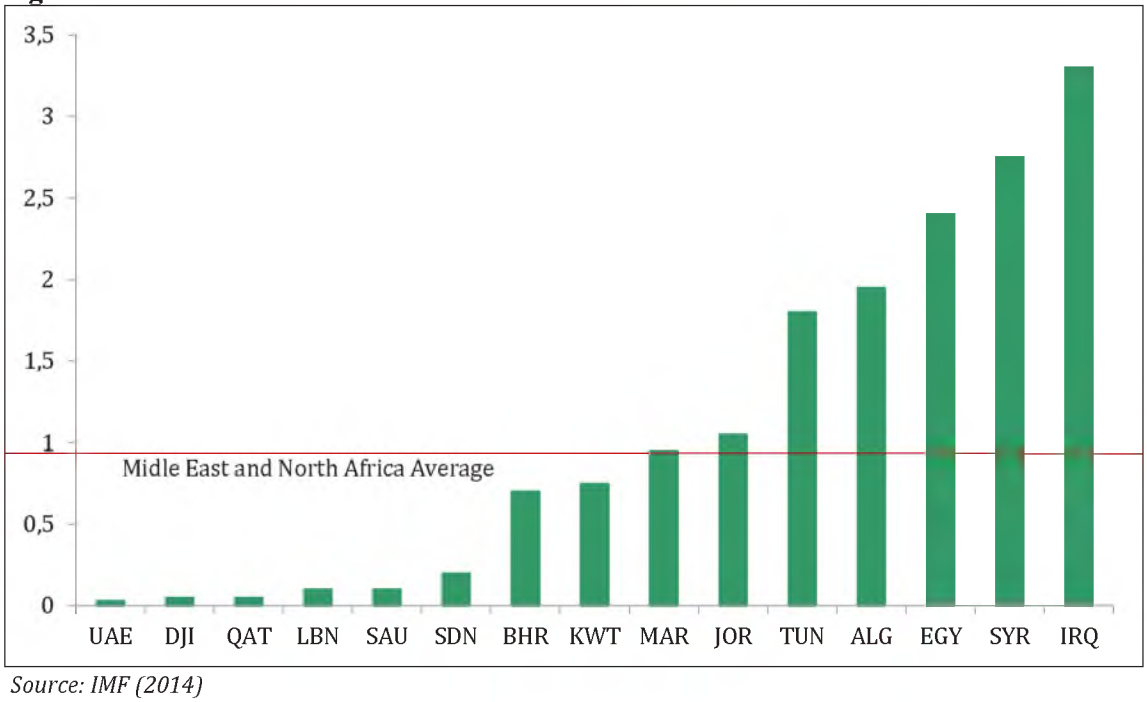
In a follow-up study by Ruttan et al. (2015) they found that when EU consumers waste less food, they demand less food as they need to buy less to be as well off as before, therefore both the

demand and production of food decreases. This is could to lead to a fall in food prices in which consumers gain from the lower food prices.

Reducing pressures on OIC Member Country government budgets

Most OIC Member Countries have had a long history of subsidizing food prices e.g. bread in Turkey and Egypt. Governments rely on subsidies as a form of social protection to meet several objectives including the elimination of poverty. Subsidized food accounts for nearly a fifth of poor households' food expenditure (Breisinger et al., 2013). Moreover, subsidies are used to shield the population from shocks caused by large swings in commodity prices, particularly in food importing dominant countries. These policies ensure food security by providing basic goods to low income individuals at prices lower than the market price. Moreover, it protects the poor from the impact of high food prices during turbulent periods. Figure 23 illustrates OIC Member Countries that provide food subsidies, reflected as a percentage of total GDP. Iraq, Syria, Egypt and Algeria are the Top 5 countries for subsidy provision.

Figure 23: Food subsidies in the Middle East & North Africa



Source: IMF (2014)

As mentioned previously, bread is commonly subsidized by some OIC Member Countries. This has led to high bread waste. In Egypt, bread is central to the Egyptian diet. Egypt imports almost twice as much wheat as all 27 EU member states, and is the largest wheat importer in the world (Elmenofi et al., 2015). Much of this wheat is used to bake subsidized 'baladi' bread which accounts for 71% of bread consumed by poor households, leading to high wastage along the bread supply chain (Elmenofi et al., 2015, Ramadan 2015).

According to the FAO, 43% of purchased wheat is not converted into bread. As such, waste associated with locally produced and imported wheat is estimated at more than US$0,957 billion (FAO 2013). In addition, Egyptians use subsidized bread as animal feed, as it is cheaper relative to the price of animal feed (Elmenofi et al. 2015, Ramadan 2015). A similar situation was

experienced in Tunisia, where bread (which is also subsidized) ranked first among food products wasted – with a waste rate of 16% of total bread purchased. The cost of waste bread from bakeries, hotel units, households and canteens is valued at US$47 million per year in Tunisia.

Food subsidy programs can create a substantial fiscal burden on governments. Food-price shocks drive up the cost of government food subsidies. At the same time, a common government response to shocks is to increase the coverage and size of these subsidies, driving up costs even further. In some countries, subsidies could become a major fiscal problem if commodity prices remain high or there are future price shocks, while social and political considerations may make rationalizing food subsidies unpopular. Zaid (2014) argues that the elimination of subsidies would not be the right solution as this could negatively affect vulnerable people. Given this predicament, reducing food waste could contribute to reducing pressure on government budgets by reducing the volumes of food that would need to be subsidized in the first place.

5. LEGAL, SOCIAL AND CULTURAL MEASURES OF FOOD WASTE

This section explores legislative, cultural and social measures adopted by OIC Member Countries to reduce food waste.

5.1. Legislation and food waste reduction

A review of legislation associated with food waste in the OIC Member Countries suggests that very few countries have regulations that focus specifically on reducing food waste. However, many do have general waste or environmental legislation, or plans within which food waste could be incorporated. What is apparent is that legislation either does not exist, is very poorly administered or is the remit of too many departments resulting in poor implementation, or is co-ordinated at a national level but not applied at a provincial or regional level (Anon., 2016b). Within this context, it is worthwhile to explore more general waste management, or food hygiene (e.g. date labelling) legislation to ascertain where or how food waste reduction could be incorporated into a broader set of current legislation (if it exists).

Table 20 provides an overview of different legislative frameworks adopted by OIC Member Countries that do or could include food waste. The lead or responsible authorities are identified, alongside a commentary on the administrative quality of application. Whilst not legislation, where government or national food waste plans have been implemented and adopted, these are also listed as they could set a foundation for any future legislation and policy developments in the countries of application.

Table 20: Legislative frameworks adopted in the OIC Member Countries to reduce food waste and/or could be linked to the reduction of food waste

Country	Legislation	Lead or responsible authorities	Details
Afghanistan	No specific food waste or associated relevant legislation	Ministry of Agriculture, Irrigation & Livestock (MAIL); Ministry of Public Health (MoPH); Municipalities	Responsibility for the control of raw foods (MAIL) and processed foods (MoPH), and food waste (Municipalities). Responsibilities don't transpire into policies and disparate (Khalid, 2016)
Bangladesh	No specific food waste legislation Associated National Environmental Policy, 1992	Ministry of Environment & Forests (MoEF)	Aim to provide protection and sustainable management of the environment. One of the objectives is to ensure the sustainable and environmentally sound use of all natural resources – which would include food and food waste (Clemett, n.d.)
Brunei Darussalam	No specific food waste or associated relevant legislation	Ministry of Health: Environmental Health Development Unit;	MoH - Functions include the preparation, planning and monitoring activities, assessment, management and control of

		Department of Environment, Parks and Recreation (more disposal)	environmental pollution in areas such as food waste
Cameroon	The National Waste Management Strategy	Several ministerial departments have mandates to implement solid waste management regulations and the highest body responsible for municipal solid waste management is the Inter-Ministerial Commission for Municipal Waste Management (ICMWM)	The only policy broadly dealing with the issues of waste in the country (Bikobo, Daho, & Siyam, 2010). A lack of policy and implementation by Government and municipalities has resulted in a systematic failure to address waste issues – including food waste (Mbeng et al., 2009). Despite Government efforts to create and implement legislation related to sustainable waste management, the current policy framework is not efficient. Inadequate legislation is highlighted as the main reason for this inadequacy (Mbeng, Phillips, & Fairweather, 2012)
Egypt	Elmenofi et al. (2015) in their research on household food waste in Egypt note that there are no policies or action plans at a government level that deal directly with waste.		
	Articles 37 – 41 of the Environmental Law 4/1994 deal mainly with solid waste	Ministry of Environmental Affairs Egyptian Environmental Affairs Agency (EEAA)	Environmental Law 4/1994: Within the framework of the Law, some efforts were undertaken by the State in order to preserve the environment with an emphasis on the concept of sustainable development (Ministry of Foreign Affairs and International Cooperation, 2010)
	Bread-subsidy smartcard	Ministry of Supply	Aims to reduce food waste associated with bread subsidies, and reduce costs of importing flour (Balch, 2015)
	Agricultural Strategy 2030	Ministry of Agriculture and Land Reclamation	Through its programs and action plans it covers food safety and agricultural waste (Elmenofi et al. 2015)
Indonesia	Government Regulation No. 81/2012 on the management of household waste		To regulate the at-source separation of waste into five different waste categories. Food waste would be one of these categories (Aprilia, 2013)
	Law No.18/2012 on Food		Includes food being a basic human right, and Indonesian citizens having access to safe and healthy food, produced in Indonesia (self-sufficiency). The law mentions the

			production and consumption of food in an optimal and sustainable manner. This would include elements related to a reduction in food waste (Rafani, 2014)
	Presidential Decree 61/2011, National Action Plan to reduce GHG emissions (RAN-GRK)	Central Government, Local Governments, private sectors/business actors and civil society	A national guideline for emission reduction covering 70 programmes, including waste management (which should/could include food waste) (Nachmany et al., 2014)
Iran	National Development Plan	Ministry of Interior, Department of Environment	Target to reduce agricultural food waste (Rastegary, 2015) There is no independent organization responsible for waste management at provincial level (Anon., 2016b)
Iraq	National Solid Waste Management Plan	Ministry of Environment	Little information. Much of Iraq's waste management systems and structures have been affected by war
Jordan	Environmental Protection Law No. 52 of 2006	Ministry of Environment	There is no specific legal framework or national strategy for solid waste management (Yamin, 2015). However, the Environmental Protection Law gives a clear and concise statement as to how jurisdiction for waste management is addressed among key government institutions (Nait, 2015)
	National Agenda for Solid Waste Utilization (2006)		A comprehensive political and socio-economic reform plan for the country until 2017. The first recommendation is to develop solid waste management policies, promote environmentally sound disposal sites, encourage recycling and minimize solid waste generation (Aljaradin & Persson, 2014)
Kuwait	EPA Law No 21/1995	Environment Public Authority	This law focuses more on the administration of environmental policy, and an environmental plan covers a variety of environmental issues, but little on solid waste management, and none on food waste. Legislation is poorly enforced, with low institutional capacity to do so (Tortell & Al-Essa, 2011)

Kuwait	EPA Law No 21/1995	Environment Public Authority	
Malaysia	National Strategic Plan for Food Waste Management (in development)	National Solid Waste Management	Plan to cover the following: • Diversion of Food Waste from entering the landfill (minimization) • Proper treatment of food waste generated • Effective recovery of landfill gasses (bin Yahaya, n.d.)
	Food Recycling Law	Department, Urban Wellbeing, Housing and Local Government Ministry	The law focuses on food waste recycling rather than food wastage for the food and beverage industry, but it still helps to reduce food wastage indirectly (Pillay & Daim, 2016)
		Agriculture and Agro-based Industry Ministry	Are co-ordinators, with the Malaysian Agricultural Research and Development Institute (Mardi), for the MYsavefood programme to promote food loss and food waste reduction (Anon., 2016a)
Mali	Decree number 01-394/P-RM from September 6th 2001.	National Directorate of Sanitation and Pollution Control	Solid wastes management decree covers the prevention and reduction of the solid wastes and their harmfulness (this could include food waste) (Samake, Tang, Hlaing, & Wang, 2009). However, solid waste management is very poor in Mali, and any regulations are poorly implemented at a local level (UNEP, n.d.)
Niger	Hygiene legislation (no. 93-13, 1993)		Waste management and handling is not well developed. Non-hazardous waste is partially regulated by hygiene legislation (Hammer, 2014)
Oman	Law on Conservation of the Environment & Prevention of Pollution	Be'ah: Ministry of Environment	Aside from these overarching laws and the Ministerial decision, the country does not have any legislation on waste management (Umar, 2016)
	Ministerial Decision No. (17/93) Regulations for the Management of Solid Non-hazardous Waste		

Pakistan	'One-dish' law	Supreme Court	To allow only one-dish at weddings in Islamabad (Azeem, 2015)
	MSW policies	Environment Ministry	From a municipal solid waste perspective, some policies exist (it is not clear as to what these are), implementation levels are poor due to ill-equipped governmental institutions (Punjab State Government, n.d.; Zahidi, 2014)
Palestine	Palestinian Environmental Law No 7 (1997)	Palestinian National Authority	The second section of this law deals with issues relating to solid waste in several articles, specifically Articles 7 to 10. This is predominantly focused on infrastructure – where feasible, and within limitations of Israel's restrictions on activities and Palestine National Authority. Due to the political instability of the region, there is a lack of infrastructure and services (European Environment Agency, 2014)
	National Environmental Action Plan (NEAP)	Palestinian National Authority	Sets out actions and projects necessary to solve or alleviate environmental problems in Palestine, including solid waste which would include food waste)(European Environment Agency, 2014)
	National Strategy for Solid Waste Management (NSSWM) (2008)	Ministerial Cabinet	It constitutes the reference point and strategic framework for all decisions, programmes, activities and medium-term investment plans, aiming to develop the solid waste sector (European Environment Agency, 2014)
Qatar	Qatar National Development Strategy 2011-2016	Ministry of Municipality and Environment	The country will adopt a multi-faceted strategy to contain the levels of waste generated by households, commercial sites and industry – and to promote recycling initiatives (Zafar, 2016b)
	Solid Waste Management Plan		Has a target to reduce household waste (this would include food)
	Qatar National Vision 2030		Linking food and nutrition security to the nation's environmental and economic development (UNEP, 2014)

	National dietary guidelines	Supreme Council of Health	Integrates principles of food sustainability, incorporating environmental sustainability and food security, and population concerns over food waste (Seed, 2014)
Saudi Arabia	Environmental Standards on Material Recovery and Recycling of Waste (2012)	Ministry of Municipal and Rural Affairs; Presidency of Meteorology and Environment	A guidance document which is intended to be the foundation for the development of best environmental practices in relation to waste recovery and recycling (Chakibi, 2013)
Senegal	The Art 8 of the Constitution	Ministry of environment and Sustainable Development; Environmental, Economic and Social Council; Direction of Environment and Classified Establishments	Includes the principle of environmental protection "the Republic of Senegal guarantees all citizens the right to a clean and healthy environment" (Dakono, n.d.)
	The Environment Code		The management of environment and natural resources is decentralized to local authorities by the decentralization Act (1996) (Dakono, n.d.)
	National Action Plan for the Environment (2004), and National action plan of promoting sustainable production and consumption (2002)		Covers the environmental impact of domestic waste
Sudan		Higher Council for Environment	Lack of waste management legal frameworks (policy, law, regulations etc), and the waste sector is not given priority in the government (political) agenda (AWEPA, 2013)
Suriname			Lack of legislation and outdated legislation (Ministry of Foreign Affairs, 2013)
Tunisia	Sustainable Development Strategy (2014-2020)	Ministry of Environment; National Agency for Waste Management (ANGed)	Little information available on the plan or other waste legislation

Turkey			Turkey has 7 major laws addressing directly or indirectly food waste reduction dating from 2005 to 2013. Most focus on agricultural waste and health and safety of food (Erdem and Galani, 2016)
	The Circular on Bread Waste Prevention Campaign (Circular no 2013/3)		Its aim is to prevent the food waste with the meaning of bread for all social layers and in public, industrial, retailer, and food service organizations (Erdem and Galani, 2016)
	Income Tax Law (Serial no. 251 - 2004), and Value Added Tax Law (Law no. 3065 - 1994)		1) Grants donors the right to deduct their food donations to food banks from their taxable income, and 2) foods donated to foundations and associations which operate for food banking purposes by taxable persons to tax -exempt foundations and public benefit associations are exempt from VAT (Erdem and Galani, 2016)
Uganda			No deliberate policy has been developed by municipal authorities to implement the waste management hierarchy (which could include food waste reduction). Some environmental policies do exist, but they are not enforced by authorities (Komakech, 2014)
Chad, Cote d'Ivoire, Djibouti, Gambia, Guinea, Mauritania, Togo			No information identified

Sanctions on countries, such as Iran and Iraq have led to food or waste management plans that encourage self-sufficiency – this includes the provision of food. In the case of Indonesia, they have a very specific 'Law on Food' with a primary focus on self-sufficiency, which also acknowledges food waste. With self-sufficiency being a focal point for several OIC Member Countries, this would create a platform for introducing concepts and actions to reduce food waste, as all food produced has significant value within a self-sufficient economy.

The impact of war has also had an effect on waste management whereby infrastructure and systems are destroyed (Knowles, 2009). With the basics of administering and providing services for waste management not in place, it makes it difficult to implement specific legislation or action to reduce food waste.

The cost of implementing legislation could also be a limiting factor, especially in countries that have little or no waste management legislation. However, starting or restarting from such a low-

base could also aid in introducing new measures to reduce food waste in new legislation, systems and infrastructure.

Many OIC Member Countries are struggling with even basic waste management infrastructure and legislation, however a few countries have introduced legislative frameworks that incorporate food waste. The most notable being:

- Turkey's 'Circular on Bread Waste Prevention', and Egypt's 'Bread Subsidy Smartcard' to reduce bread waste.
- Indonesia's 'Law on Food' which focuses predominantly on self-sufficiency but sees the optimal consumption of food as a solution to self-sufficiency.
- Pakistan's 'One-dish' law (adopted from India) to reduce excessive food consumption and waste generated at weddings.
- Qatar's ground-breaking National Dietary Guidelines which integrate principles of food sustainability (including waste) and nutrition.

5.1.1. Date labels

One of the biggest contributors to household food waste is the confusion around date labels. The use of food labels to check expiry dates, and food reaching its expiry date are significant concerns to be addressed in order to reduce food waste in the OIC Member Country households. Households clearly use expiry dates as an important mechanism for purchasing food (see Table 21), and food reaching its expiry date is one of the main reasons food is thrown away at home (see Table 22). If there is confusion about date labels, and they are being used widely within households to make decisions, then this confusion needs to be addressed.

Table 21: Frequency of checking expiry dates when purchasing food

Country	Frequency of checking expiry dates	% of answers
Afghanistan	Always	20
	Often	25
	Sometimes	20
	Rarely	25
	Never	10
Benin	Always	40
	Often	20
	Sometimes	10
	Rarely	5
	Never	25
Cameroon	Always	65
	Often	13
	Sometimes	16
	Rarely	4
	Never	1
Saudi Arabia	Always	23
	Often	17
	Sometimes	42
	Rarely	16
	Never	3
Senegal	Always	40
	Often	10
	Sometimes	25
	Rarely	15
	Never	10
Turkey	Always	75
	Often	19
	Sometimes	5
	Rarely	1
	Never	
Uzbekistan	Always	65
	Often	15
	Sometimes	5
	Rarely	10
	Never	5

Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.

Table 22: Main reasons given for throwing away food

Country	Most common reasons causes	% of answers
Afghanistan	Over-purchasing	50
	Over-stocking	5
	Not willing to consume leftover food	25
	Expiry date	5
	Lack of storage space	0
	Need for freshness	0
	Other	15
Benin	Over-purchasing	0
	Over-stocking	5
	Not willing to consume leftover food	5
	Expiry date	30
	Lack of storage space	0
	Need for freshness	0
	Other	60
Cameroon	Over-purchasing	16
	Over-stocking	3
	Not willing to consume leftover food	13
	Expiry date	46
	Lack of storage space	2
	Need for freshness	17
	Other	2
Saudi Arabia	Over-purchasing	36
	Over-stocking	11
	Not willing to consume leftover food	6
	Expiry date	40
	Lack of storage space	3
	Need for freshness	3
	Other	0
Senegal	Over-purchasing	0
	Over-stocking	30
	Not willing to consume leftover food	5
	Expiry date	10
	Lack of storage space	50
	Need for freshness	5
	Other	0
Turkey	Over-purchasing	5
	Over-stocking	3
	Not willing to consume leftover food	14
	Expiry date	41
	Lack of storage space	5
	Need for freshness	31
	Other	2

Country	Most common reasons causes	% of answers
Uzbekistan	Over-purchasing	11
	Over-stocking	16
	Not willing to consume leftover food	11
	Expiry date	53
	Lack of storage space	0
	Need for freshness	0
	Other	0

Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.

A review of date label legislation adopted by OIC Member Countries suggests that many countries do specify content for food labels, especially for food imported into the country. This content includes elements such as: list of ingredients, allergenic ingredients, nutritional value, product quantity, date of minimum durability, special storage instructions, if the product contains alcohol, country of origin and instructions for use.

Little information was found relating to date label use and shelf-life in the OIC Member Countries. Of the few examples identified, Turkey has adopted EU Directives on the Labeling, Presentation and Advertising of Foodstuffs; and Nutrition Labeling of Foodstuffs. For products imported into the country, all labels must be translated into Turkish (Ozbag, 2016). Food labels used must also the date of minimum durability for highly perishable goods (due to microbiological activity), 'use by' and date. A 'best before' date containing day and month for foods expected to keep for three months or less, or a 'best before end' date containing month and year for foods expected to keep for more than three months but not longer than eighteen months, or 'best before end' date containing either month and year or year only for foods expected to keep for more than eighteen months. Any special storage and use instructions should also be included (Ozbag, 2016).

As with Turkey, Saudi Arabia also requires food labels on imported food to be in Arabic or translated into Arabic. From the perspective of trying to encourage consumers to reduce food waste, this is critical as instructions on proper storage, cooking methods and 'use by' dates are important to adhere to for food waste reduction at home. Saudi Arabian food labelling legislation also makes specific reference to shelf-life date labels being clear and unambiguous (Indian Institute of Foreign Trade, n.d.).

Whilst little information was obtained on shelf-life and date label legislation in the OIC Member Countries, it can be assumed that date labels cause just as much confusion to householders in these countries as they do in countries where food waste behaviors and causes have been investigated in relation to date labels e.g. the UK (Enright, Good, & Williams, 2010). Due to this confusion and the link to food waste, the US recently introduced a food waste bill that will make expiry date labelling more consistent and coherent, with the end goal to help reduce a key trigger of food waste in America (Wee, 2016).

5.2. Social and cultural considerations and measures

> *Eat and drink but waste not by extravagance, certainly He (Allah) likes not Al-Musrifun (those who waste by extravagance (Al-A'raf - 7:31).*

In the Quran, and Islamic teachings on food waste, it is unlawful to throw away food and waste it, particularly that which can still be consumed by humans. Should this situation arise, it is advised that food suitable for human consumption is given or offered to the poor and needy (without regard to race or religious affiliation), and if there are no needy people, then it should be given to animals (Islamic Centre of Reading, 2016).

Among the main global religions – such as Christianity and Judaism – Islam is the only religion to refer specifically to food waste, and morality associated with food waste (Sustainablog, 2014). Other religions tend to focus on gluttony as a vice.

Islam also provides guidance on how to reduce food waste:

> *It is He Who has brought into being gardens, the cultivated and the wild, and date-palms, and fields with produce of all kinds, and olives and pomegranates, similar (in kind) and variegated. Eat of their fruit in season, but give (the poor) their due on harvest day. And do not waste, for God does not love the wasteful [Quran 6:141].*

5.2.1. Curbing extravagance

The excess preparation of food, and associated waste in the OIC Member Countries is often linked to large-scale occasions such as banquets and weddings. This excessiveness wastefulness is addressed by Allah in the Quran:

> *O you who believe! Do not make unlawful the wholesome things which God has made lawful for you, but commit no excess for God does not love those given to excess [Quran 5:87].*

> *Eat of the wholesome things We have provided for your sustenance, but commit no excess therein, lest My condemnation fall upon you; he upon whom My condemnation falls has indeed thrown himself into utter ruin (Quran 20:81).*

Food is seen as a gift from God and wasting it is seen as a sign of ungratefulness for this gift (Reem, 2011). Islam states that leftover food should be shared. What is required is that food should be enjoyed, but not in excess. If there is waste, the consumer is solely responsible for finding a solution or outlet for food that is still fit for human consumption (Sustainablog, 2014).

This excessiveness is not recorded in all OIC Member States, for example, Siddique (2013) suggests that food waste in Bangladesh is minimal as for most middle or lower middle class families the throwing away of food is considered unthinkable, with surplus food either divided among the extended family or given to the poor. Siddique also argues that food waste is less likely to be an issue as 30% of the population is below the poverty line, and the saving of food for 'another day' is important for survival. On the opposite end of the scale, Saudi Arabia as an extremely wealthy country consumes large volumes of food of which approximately 35% is wasted. It has been estimated that if this food waste was reduced by 30%, it could reduce food

prices by 15% (Al-Fawaz, 2015). In a study conducted on food waste by the University of Brunei Darussalam (Floridzah & Fauziah, 2011) the preparation of food beyond that which can be consumed for social events is common practice in Brunei. The study suggests the main reasons for preparing too much food is due to it being an embarrassment or unacceptable to run out of food on such occasions. In addition, there is little guilt felt by guests for not finishing the food prepared (Mbeng et al., 2009).

The largest sources of food waste at social functions are from wedding halls and hotels (Bajaj, n.d.). In response to this, countries such as Afghanistan, Egypt, Saudi Arabia and Bangladesh have set up programs to distribute surplus food from these venues. There is a ready stream to tap into for food redistribution, particularly when it has been estimated e.g. in Saudi Arabia that up to 70% of food prepared in hotels and wedding halls is not consumed (Al-Fawaz, 2015). The Afghanistan Centre for Excellence (ACE) (n.d.) implements a pilot campaign 'Don't let good food go to waste – donate it', where surplus food from its wedding halls is donated to the needy – this food is referred to as social surplus. The initiative not only provides meals but also aims to create awareness around food waste, while encouraging greater involvement from the community. This very much answers the Islamic call to donate unwanted food to the needy. This is again echoed by the distribution of surplus food through food banks, in countries such as Egypt and Pakistan (Zafar, 2016a). The image below shows members from the Afghanistan Centre for Excellence distributing food.

Source: Afghanistan Center for Excellence (n.d.)

Dubai has also laid down new guidelines to cut food waste and streamline the donation of excess food prepared at banquets and buffets. The 'Heafz Al Na'amah' is a notable initiative to ensure that surplus food from hotels, Iftar parties and households is not wasted and reaches the needy in safe and hygienic conditions. The donating of food is also practiced more informally in Bangladesh where it is a common sight to see street vendors in Dhaka selling reclaimed food, such as pulao and biriyani from weddings and large public functions (Siddique, 2013). This is not only a convenient way for the food sector to divert surplus food, but it is also an important livelihood for the street vendors (Etzold, Hossain, & Rahman, 2014). In Pakistan, the extravagant serving of food at weddings, and subsequent waste, has led to the Supreme Court implementing a 'one-dish' law for weddings. In addition to curbing food waste, such initiatives also reduce the burden on wedding expenses, which is said to place a huge strain on Pakistani families (Fahad, 2015).

There is also evidence of restaurants in the OIC Member Countries initiating activities to reduce food waste for religious reasons. For example, 'Marmar' – a restaurant in Saudi Arabia – has started to fine customers who order food and do not finish it. This policy is based on the Islamic principle of not wasting food, and people should only eat what they need (Reem, 2011). However, in some countries, there could be a backlash from customers, as suggested by one restaurant owner in Kuwait, "We'd get a lot of complaints if we introduced such charges because it's not in line with the culture, and would be perceived as an insult" (Lyon, 2012). This statement is supported by several restaurants in Kuwait who note that it is tradition to 'order with the eyes' and not for oneself, but for everyone at the table. They argue that this is a tradition that should not be curtailed (Lyon, 2012).

Whilst fining will not be appropriate for all establishments, restaurants can encourage their customers to order less. This is the case in the City of Petaling Jaya in Malaysia, where the Council tries to encourage hotels to encourage their customers to order wisely and to provide containers for customers to take home leftover food (Pillay & Daim, 2016). However, some hotel owners are concerned about allowing customers to take away leftover food because of health and safety concerns. Not only are health concerns an issue, but there is also the social stigma of taking food home from a restaurant. A recent study undertaken at high-end restaurants in Karachi, Pakistan noted that taking home leftovers from a high-end restaurant was almost considered to be 'social suicide' (Javed, 2016). This stigma of not wanting to take home leftovers is a stark contrast to the number of hungry people living in the city. This led to the setting up of a program to distribute 'Food for Thought' boxes from restaurants. Customers can place their leftover food in boxes provided by the program, and the food is distributed to the needy. Other examples include in Egypt where a program to distribute food from 5-star hotels and other restaurant establishments has been running successfully since 2012. Called the 'Not to Waste Food' Program, it serves approximately 17 million meals a month (Global Food Banking Network, 2014). The image below shows children receiving 'Food for Thought' boxes distributed in Karachi, Pakistan.

Source: Javed (2016)

The 'stigma' of not wanting to consume leftover food is not only an issue associated with high-end restaurants, but is also a general cultural issue, where fresh food is considered more

hygienic and standardized than pre-prepared or cooked food (Tago, 2016). In addition, it is reported that consumers regularly purchase too much food, as illustrated by a term in Indonesia 'lapar lata', which literally means 'to shop with your eyes' (Soma, 2016). This means if you do not shop with a list, you will buy too much. In such situations, Soma (2016) argues that the role of the street vendor selling food could be a solution to reducing food waste, as vendors have a limited variety of products and they come every day. This would help householders to manage their food stocks, and therefore only need to buy what they need for and on the day. This can also prevent food waste being generated at home due to poor refrigeration. The use of street vendors as a solution is an interesting one, as the consumption and purchase of food from street vendors is common practice in many Islamic states (see reference to Bangladesh above). The image below shows a food street vendor in Tukang Sayur, Bogor, West Java, Indonesia.

Source: Soma (2016).

At the household level, bread is a core component of many OIC Member Country diets, and has a prominent place in Arab culture (Capone et al., 2016). It is often one of the highest food waste categories, for example in Tunisia bread ranked first among products wasted, with a rate of 16% of bread purchased (TAP, 2016), and in Turkey, approximately 10% of bread produced daily is wasted (Erdem & Galani, 2016). This is often linked to the over-provision of bread through subsidies, for example, in Egypt bread subsidies allow poorer families five loaves of bread per day. Given that Egypt not only imports a lot of flour to make this bread and not all the bread is consumed results in unnecessary spend on flour imports. As such, the Ministry of Supply initiated a smartcard system which enables families that do not want all five loaves a day to trade points for other staple foods. This has resulted in an estimated reduction of bread consumption (and therefore associated waste) by 15-20% (Balch, 2015). Turkey have also initiated a similar program - 'Circular on Bread Waste Prevention Campaign (Circular no 2013/3)'(Erdem & Galani, 2016) to reduce bread waste. A year on from its establishment a reduction in bread waste of 18% was achieved. The aim of the campaign was to raise awareness of the amount of bread wasted and to recognised it as a 'holy and blessing product' (Turkish Grain Board, 2014).

The extravagance of consumption can also have serious health implications, such as obesity, which has become a greater global burden than malnutrition (Gray, 2013). The UN has identified the link between over-consumption, food waste and health and as such has programs which move away from a sole focus on food waste to sustainable food systems e.g. the 'Sustainable Food Systems (SFS) Programme' of the 10-Year Framework for Programmes on Sustainable Consumption and Production Patterns (10YFP)(UNEP, 2016). This emerging trend is also being picked up in some Islamic states, such as Qatar, which has produced one of the first national dietary guidelines to integrate principles of food sustainability, and incorporates environmental sustainability and food security, and population concerns over food waste (Seed, 2014).

6. COUNTRY CASE STUDIES AND SURVEYS

The following section provides a detailed overview of findings generated from data gathered from household and food service sector surveys, undertaken in:

- Afghanistan
- Benin
- Cameroon
- Saudi Arabia
- Senegal
- Turkey
- Uzbekistan

Detailed case studies are provided for Cameroon, Saudi Arabia and Turkey. The other countries listed provide insights into the variations that exist within some of the OIC Member Countries. It is from these case studies and surveys that an indication of the extent of food waste generated, and causes, can be generated for OIC Member Countries. It must be noted however that these indicate practices across the Member Countries, and as they do not capture practices across all OIC Member Countries the results cannot be used to represent OIC Member Countries as a whole – they are an indication and provide a good illustration of the variations across the different countries.

The extent of food waste for households and the food service sector in the countries surveyed are presented below, and is accompanied by data which illustrates the main causes for why food waste arises. For full-length detailed analyses for each country see Annex 2.

6.1. Methodology

6.1.1. Household surveys

The methodology adopted for sampling households was designed by considering the urban-rural settings and economic status of households in the surveyed countries. A random sampling method was used to select and interview households.

6.1.2. Food service surveys

The food service sector survey sample was organized according to types of food service establishment e.g. pubs and bars, cafes, restaurants, hotels and dining halls (catering companies). A random sampling methodology was used to select the establishments in each country.

6.1.3. Survey limitations

- The representativeness of samples selected in each country were limited to the locations where data collection activities were conducted.
- The cities listed in Table 23 were surveyed in each country and generated data is limited in terms of representing a whole country.

- The statistical estimates pose sampling errors.
- The accuracy and precision of statistical estimates relies on the accuracy of respondents' responses.

Table 23: Country survey sample size

Country	City	Sample size (no. of households)	Sample size (no. of food service establishments)
Afghanistan	Kabul	20	20
Saudi Arabia	Riyadh	100	100
Cameroon	Yaoundé	100	100
Benin	Cotonou	20	20
Uzbekistan	Fergana and Kokand	20	20
Senegal	Dakar	20	20
Turkey	Ankara	100	100

6.1.4. Qualitative surveys and interviews

As a part of the data collection, and to identify information about projects and legislation practices, in-depth interviews were conducted in Cameroon, Saudi Arabia and Turkey. Experts from relevant ministries, international agencies, national and international non-governmental organisations and sectoral key informants were interviewed to obtain information about food waste in their countries.

6.1.5. Data interpretation

When viewing the case study data, the following should be considered:

- Volumes of waste generated are respondent estimates i.e. weights are not actual (i.e. no weighing took place).
- Whilst it is generally recognised (see pg.31) that larger households produce less food waste, the surveyed households reported high volumes of food waste. One of the main reasons for this could be due to the very large household sizes, for example in Afghanistan the average household size was 10 members, and in Cameroon 8.
- For Cameroon and Senegal, the following applies:
  - A limit on the volume of waste was given to respondents. As such, if respondents produced more than the maximum, this was not recorded.
  - Many respondents noted a casual or no concern for food waste. Therefore, the accuracy of the data provided by those completing the survey should be taken as an indication, as opposed to fact.
  - The level of education for many respondents is low, which would suggest that the articulation of estimates and understanding of units of measure is low. This might suggest why there are some significant disparities between results, and large estimates.
  - Respondents were not given forewarning of the survey, and as such provided estimates as immediate responses.

As with most studies of this kind, data should be interpreted as indicative. However, whilst indicative the results provide an in-depth understanding of likely practices and the extent of food waste across OIC Member Countries. As such, this study provides a useful platform for further research and highlights where areas of data collection can be improved, or issues considered.

6.2. Country survey results

To provide a reference or benchmark of this research's findings in relation to World food waste figures, an estimate of a country's contribution to World food waste production was derived to get a sense of scale (see Table 24).

Table 24: Estimated share of the world and region's food wasted by the households and the food service sector, by country

Country	Share of the World's food wastage	Share of the country's regional area's food wastage
Afghanistan	2,3175 x 10^{-8} %	4,326 x 10^{-7} %
Benin	1,12 x 10^{-8} %	6,38 x 10^{-7} %
Cameroon	1,094 x 10^{-8} %	6,128 x 10^{-7} %
Senegal	7,103 x 10^{-8} %	3,9776 x 10^{-6} %
Saudi Arabia	5,175 x 10^{-9} %	9,66 x 10^{-8} %
Turkey	2,315 x 10^{-8} %	4,322 x 10^{-7} %
Uzbekistan	2,152 x 10^{-8} %	4,017 x 10^{-7} %

Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.
Note (1): Percentages were derived from the data collected in the field and reported against the global amount of food wasted at the consumer stage in the world (280 million Tonnes) according to the FAO (SIK, 2013) and reported against the region to which each country belongs (15 million Tonnes in North Africa, Western and Central Asia and 5 million Tonnes in Sub Saharan Africa) according to the FAO (SIK, 2013).
Note (2): It should be considered that these data do not actually represent the all food waste generated, as it only represents the waste produced by the households and by food service establishments sectors, excluding the rest of the private and public sectors that should also be taken into consideration to calculate the total quantity of food waste produced in the country in each year.

6.2.1. Households

On average, surveyed households generated 1.64 tonnes of food waste per year, ranging from 48kgs in Benin to 2.8 tonnes in Afghanistan. Due to the potential irregularities outlined above, these figures are very much an indication of the potential extent of food waste, and should be viewed with caution (especially when comparing figures to estimated volumes produced by European households, which appear to be much lower).

Fruit and vegetables are the largest contributing food type to total food waste at home - Afghanistan (49%), Saudi Arabia (29%), Turkey (38%) and Uzbekistan. Whilst in Benin (39%), Cameroon (30%) and Senegal (28%), meat, eggs and legumes contribute the most.

Across all households, most food waste is generated during the preparation stage, ranging from 44% to 85% of waste. Plate waste (leftovers) is also significant for all households. Table 25

provides an overview, and Table 26 more detail, of the extent of food waste within the surveyed households, by food type and consumption stage.

Table 25: Estimate of average food wasted per household member, per year

Country	Food wasted (kgs)
Afghanistan	705
Benin	8
Cameroon	38
Saudi Arabia	119
Senegal	94
Turkey	286
Uzbekistan	636

Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.
Note: The figures in the above table derived from the field survey results, i.e. the average total amount of food wasted each year by the households in the country divided by the average number of members in that country. To calculate the accurate food waste per capita per year within a given country, the total quantity of food wasted by both the whole private and public sectors would be needed, which was outside the scope of this study.

The main reason provided by households for generating food waste is due to hygiene and health e.g. food is no longer considered fit or hygienic for consumption. This was the case for all countries, except Afghanistan, where most respondents claimed a need for fresh food for cooking led to higher waste rates.

Food reaching its expiry date was also recorded as one of the most common reasons for throwing away food. This was the case for all surveyed households, except for Afghanistan where householders noted that most food waste was generated from the over-purchasing of food.

More detailed analyses of disposal routes and knowledge of food waste amongst householders is presented in Annex 2.

Table 26: Estimated average household food waste

Country	Food type	Average food waste generated					
		During food preparation	Serving of food	Plate waste	Total	Est. total per year (kg)	% of total
Afghanistan	Dairy products	7,200	7,850	-	15,050	783	28%
	Meat, eggs & legumes	4,650	4,430	1	9,081	472	17%
	Fruit & vegetables	13,850	12,475	2	26,327	1,369	49%
	Bread & cereals	18,450	15,875	10	10	1	0%
	Sugar & sweets	1,955	1,815	-	3,770	196	7%
	Total	**46,105**	**42,445**	**13**	**54,238**	**2,820**	
	% of Total	**85%**	**78%**	**0%**			
Benin	Dairy products	85.50	20.05	33.00	139	7	15%
	Meat, eggs & legumes	238.40	50.75	65.25	354	18	39%
	Fruit & vegetables	189.65	53.90	54.85	298	16	32%
	Bread & cereals	23.05	11.75	3.75	39	2	4%
	Sugar & sweets	46.00	25.35	19.00	90	5	10%
	Total	**582.60**	**161.80**	**175.85**	**920**	**48**	
	% of Total	**63%**	**18%**	**19%**			
Cameroon	Dairy products	431	463	217	1,111	58	19%
	Meat, eggs & legumes	1,079	488	212	1,779	93	30%
	Fruit & vegetables	506	409	397	1,312	68	22%
	Bread & cereals	548	302	206	1,056	55	18%
	Sugar & sweets	200	288	106	594	31	10%
	Total	**2,765**	**1,949**	**1,138**	**5,852**	**304**	
	% of Total	**47%**	**33%**	**19%**			
Saudi Arabia	Dairy products	810	787	266	1,863	97	14%
	Meat, eggs & legumes	1,491	1,359	423	3,273	170	24%
	Fruit & vegetables	1,612	1,775	573	3,960	206	29%
	Bread & cereals	1,532	1,342	419	3,293	171	24%
	Sugar & sweets	642	656	82	1,380	72	10%
	Total	**6,087**	**5,919**	**1,763**	**13,769**	**716**	
	% of Total	**44%**	**43%**	**13%**			

Country	Food type	Average food waste generated					
		During food preparation	Serving of food	Plate waste	Total	Est. total per year (kg)	% of total
Senegal	Dairy products	2,558	2,507	416	5,481	285	23%
	Meat, eggs & legumes	3,173	3,096	365	6,634	345	28%
	Fruit & vegetables	2,234	2,190	359	4,783	249	20%
	Bread & cereals	1,734	1,716	306	3,756	195	16%
	Sugar & sweets	1,305	1,290	176	2,771	144	12%
	Total	**11,003**	**10,799**	**1,623**	**23,425**	**1,218**	
	% of Total	**47%**	**46%**	**7%**			
Turkey	Dairy products	3,742	3,671	69	7,482	389	27%
	Meat, eggs & legumes	2,615	2,538	49	5,202	271	19%
	Fruit & vegetables	5,428	5,146	80	10,654	554	38%
	Bread & cereals	2,164	2,035	54	2,225	116	8%
	Sugar & sweets	1,111	1,103	11	2,225	116	8%
	Total	**15,060**	**14,493**	**263**	**27,788**	**1,445**	
	% of Total	**54%**	**52%**	**1%**			
Uzbekistan	Dairy products	4387,5	3,781	267	4,048	210	8%
	Meat, eggs & legumes	4,625	4,228	44	8,896	463	18%
	Fruit & vegetables	9,800	8,800	594	19,194	998	39%
	Bread & cereals	5,998	4,629	373	11,000	572	22%
	Sugar & sweets	2,925	2,533	316	5,773	300	12%
	Total	**23,348**	**23,970**	**1,593**	**48,911**	**2,543**	
	% of Total	**48%**	**49%**	**3%**			

Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.

6.2.2. Food service sector

On average, the surveyed establishments generated:

- 3 tonnes of solid food waste per year, ranging from 300kgs in Saudi Arabia to 9 tonnes in Senegal; and
- 2,100 liters of milk and other edible liquids, ranging from 330 liters in Saudi Arabia to 9,600 liters in Senegal

Due to the potential irregularities outlined above, these figures are very much an indication of the potential extent of food waste. Bakery is the largest food type wasted making up 50% of total food service sector food waste in Afghanistan and Saudi Arabia (53%). In Benin (67%), Cameroon (35%), Senegal (38%) and Turkey (40%) meat, chicken and fish contribute the most. Vegetables are also a significant contributor for Cameroon (35%), Turkey (40%) and Uzbekistan (44%).

For data that was provided, carbonated drinks were the largest beverage and drinks category to be thrown away in Afghanistan, Benin (40%), Cameroon (48%) and Uzbekistan (65%), and fruit juice in Senegal (31%) and Turkey (55%), and yoghurt in Saudi Arabia (36%). One of the main reasons for the high carbonated drinks wastes is due to many Islamic countries forbidding the consumption of alcohol, and as such non-alcoholic beverages are the preferred option. Carbonated drinks, once opened can lose their carbonation rapidly, unless stored properly, and which leads to it being thrown away when it has gone flat.

Table 27 provides an overview, and Table 28 more detail, of the extent of food waste generated within the surveyed food service establishments (restaurants, bars and pubs, and coffee houses), by food type.

Table 27: Estimate of average food wasted by food service establishments, per year

Country	Food wasted (kgs)
Afghanistan	3,669
Benin	3,142
Cameroon	2,759
Saudi Arabia	733
Senegal	18,670
Turkey	50,38
Uzbekistan	34,83

Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.
Note: The figures in the above were derived from field survey results.

Table 28: Estimated food service food waste, per country

Country	Food type	Average food waste generated			
		per day (kg)	per week (kg)	Est. per year (kg)	% of Total
Afghanistan	Average kgs				
	Meat, chicken & fish	1.90	13	692	26%
	Fruit				
	Vegetables	1.76	12	641	24%
	Bakery	3.72	26	1,354	50%
	Sweets				
	Total	**7.38**	**52**	**2,686**	
	Average liters				
	Fruit juice				
	Carbonated drinks	2.7	19	983	
	Milk				
	Yoghurt				
	Total	**2.7**	19	**983**	
	Total food & drink*	**10.1**	**71**	**3,669**	
Benin	Average kgs				
	Meat, chicken & fish	4.86	34	1,769	67%
	Fruit	2.94	20	1,070	41%
	Vegetables	1.97	13	717	27%
	Bakery	0.39	2	142	5%
	Sweets	0.28	2	102	4%
	Total	**7.22**	**51**	**2,628**	
	Average liters				
	Fruit juice	0.45	**3.15**	164	32%
	Carbonated drinks	0.56	**4**	204	40%
	Milk	0.35	**2**	127	25%
	Yoghurt	0.05	**0.4**	19	4%
	Total	**1.41**	**10**	**514**	
	Total food & drink*	**8.63**	**60**	**3,142**	
Cameroon	Average kgs				
	Meat, chicken & fish	1.50	11	546	35%
	Fruit	1.14	8	415	27%
	Vegetables	1.50	11	546	35%
	Bakery	1.29	9	470	30%
	Sweets	0.68	5	248	16%
	Total	**4.29**	**30**	**1,562**	
	Average liters				
	Fruit juice	0.81	**6**	**295**	25%
	Carbonated drinks	1.59	**11**	**579**	48%
	Milk	0.52	**4**	**189**	16%
	Yoghurt	0.37	**3**	**135**	11%
	Total	**3.29**	**23**	**1,198**	
	Total food & drink*	**7.58**	**53**	**2,759**	

Country	Food type	Average food waste generated			
		per day (kg)	per week (kg)	Est. per year (kg)	% of Total
Saudi Arabia	**Average kgs**				
	Meat, chicken & fish	0.24	2	87	22%
	Fruit	0.27	2	97	24%
	Vegetables	0.28	2	101	25%
	Bakery	0.59	4	215	53%
	Sweets	0.13	1	46	11%
	Total	**1.11**	**8**	**403**	
	Average liters				
	Fruit juice	0.20	**1**	**74**	22%
	Carbonated drinks	0.06	**0.5**	**23**	7%
	Milk	0.31	**2**	**114**	35%
	Yoghurt	0.33	**2**	**118**	36%
	Total	**0.91**	**6**	**330**	
	Total food & drink*	**2.01**	**14**	**733**	
Senegal	**Average kgs**				
	Meat, chicken & fish	9.50	67	358	38%
	Fruit	6.63	46	2,413	27%
	Vegetables	8.25	58	3,003	33%
	Bakery	7.15	50	2,603	29%
	Sweets	4.95	35	1,802	20%
	Total	**24.90**	**174**	**9,064**	
	Average liters				
	Fruit juice	8.28	58	3,014	31%
	Carbonated drinks	7.00	49	2,548	27%
	Milk	6.44	45	2,344	24%
	Yoghurt	4.67	33	1,700	18%
	Total	**26.39**	**185**	**9,606**	
	Total food & drink*	**51.29**	**359**	**18,670**	
Turkey	**Average kgs**				
	Meat, chicken & fish	4.20	29	1,529	40%
	Fruit	1.00	7	364	10%
	Vegetables	4.19	29	1,525	40%
	Bakery	2.00	14	728	19%
	Sweets	0.24	2	87	2%
	Total	**10.39**	**73**	**3,782**	
	Average liters				
	Fruit juice	1.90	13	692	55%
	Carbonated drinks	1.50	11	546	43%
	Milk	0.05	0.5	18	1%
	Yoghurt	-	-	-	0%
	Total	**3.45**	**24**	**1,256**	
	Total food & drink*	**13.84**	**97**	**5,038**	

Country	Food type	Average food waste generated			
		per day (kg)	per week (kg)	Est. per year (kg)	% of Total
Uzbekistan	**Average kgs**				
	Meat, chicken & fish	1.63	11	593	28%
	Fruit	0.66	5	240	11%
	Vegetables	2.56	18	932	44%
	Bakery	1.67	12	608	28%
	Sweets	0.11	1	40	2%
	Total	**5.86**	**41**	**2,133**	
	Average liters				
	Fruit juice	1.11	8	404	30%
	Carbonated drinks	2.42	17	881	65%
	Milk	0.18	1	66	5%
	Yoghurt	-	-	-	0%
	Total	**3.71**	**26**	**1,350**	
	Total food & drink*	**9.57**	**67**	**3,483**	

**Total food & drink assumes 1 liter of liquid = 1 kg*
Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.

The main reasons provided by food service respondents for generating food waste was due to customer leftovers. This was the case for all countries, except Turkey, where most respondents claimed customers ordering too much food led to food waste, which in turn leads to the creation of leftovers.

All the establishments surveyed, except Saudi Arabia, noted that less than 15% of their customers took their leftovers home. Respondents in Saudi Arabia suggested that over 70% of their customers did take home leftovers. Given the stigma alluded to earlier about customers taking home leftovers, this could be a major reason for such a low rate of acceptance of this practice.

In terms of food preparation creating food waste, all establishments (except in Benin and Uzbekistan) fully agreed or agreed that this was a major contributor to food waste. As the preparation of too much food was also considered a reason for causing food waste, it is useful to understand the issue of menu planning and the role this can play in reducing food waste. All establishments surveyed fully agreed, or agreed, that better menu planning could reduce the amount of food waste they generated. Buffets were considered the most wasteful serving option (as opposed to *Al la carte*) by those surveyed.

More detailed analyses of disposal routes and knowledge of food waste amongst food service establishments surveyed are presented in Annex 2.

6.3. Country case studies

Food waste data presented in the case studies below was generated from field visits and surveys. Each case study covers:

- A country overview.
- Assessment of food waste realized by the food service industry and households, and a calculation of the economic burden to the country. The distribution of food waste by types of food is also provided.
- Causes and consequences of food waste in the food service industry and households, and implications on economy, poverty, food security and welfare in the country.
- The measures and strategies implemented for food waste reduction.
- Resource allocations of each country for preventing food waste.

6.3.1. Cameroon

There is a lack of formal research and evidence on the extent of food waste in Cameroon. As such, key informant interviews and the survey results presented below provide a much-needed assessment of food waste generated in households and the food service sector in Cameroon. Further contextual information and more detailed food waste results for Cameroon can be found in Annex 2.

Summary of survey findings

It was difficult to assess accurately the amount of food waste generated in Cameroon, with those interviewed and working in the field only able to provide estimates and assumptions, which varied significantly.

The findings suggest that food waste by households is not considered significant (in terms of volume) as a large segment of the population is undernourished and therefore does not produce food waste. In some urban areas, notably in the North and Far North, it was reported that some people have no more than one meal a day (UDA Consulting, 2016). Wasting food is considered a rare occurrence in Cameroonian households. If food is leftover from a meal it is kept and used the following day (UDA Consulting, 2016).

Food waste tends to appear mainly in the cities, where surplus food is not always kept and consumed the following day. Where it is consumed in some households, the leftovers are served for breakfast, however it is becoming more common for households to have a 'common' breakfast and discard the previous day's leftover food (UDA Consulting, 2016).

Within the broader food supply chain, most food waste occurs before it reaches the household or the food service sector. Key informants suggested that significantly large quantities of food waste occurred on farm, predominantly due to poor post-crop management.

Household food waste

Of the 100 households surveyed in Cameroon, most have 8 members. Food shopping is usually done by mothers from bio-product markets and street sellers. Most households check their food stocks before shopping for food and make shopping lists beforehand. Most meals are planned days ahead. Food promotions seem to divide the respondents, with just as many saying they were enticed by them, to those who were not.

At least half of Cameroonian households often eat frozen or convenience food, with most cooking more than one type of meal at least two days a week. Most respondents rarely or never order a takeaway or eat out. Most surveyed finished all the food on their plates.

Respondents were quite divided with regards to the reasons for disposing uneaten food, however health reasons and avoiding food poisoning were the most common reasons given for wasting food. Another common reason was due to cooking or serving too much, which resulted in leftovers. Of the food waste generated, most disposed of it in the nearest bin inside the home.

Fruit and vegetables are the main food items thrown away, with Cameroonians very rarely disposing milk and other liquids. Most respondents checked the expiry date of products prior to purchase, and food going beyond its expiry date was given as the main reason for throwing out food.

At least half of respondents were not concerned about throwing food away, with most thinking food waste was not a problem as it is biodegradable. However, most did say they try to keep the food they throw away to a minimum. This would suggest a real opportunity for raising awareness about food waste, with a significant majority stating that if they were better informed on how to store food, improve their food shopping practices or were made aware of the environmental impact associated with food waste they would throw less food away.

Table 29 provides an estimate of food waste generated, and reported by respondents, in Cameroon households per year. It shows that most food is wasted during preparation, with the highest volumes of waste being for meat, eggs and legumes. The most common leftovers are fruit and vegetables.

Table 29: Estimated amount of food waste generated, on average, by a household in Cameroon, per year

Food type	Average food waste per year (kg)		
	During food preparation	Serving of food	Plate waste
Dairy products	22	24	11
Meat, eggs & legumes	56	25	11
Fruit & vegetables	26	21	21
Bread & cereals	28	16	11
Sugar & sweets	10	15	6

Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.

Food service sector food waste

103 food service establishments were surveyed (restaurants, bars, pubs and coffee houses), with most operating at least 6 days a week.

Respondents noted the main reason for food waste in their establishments was due to customers leaving leftovers, with less than 15% of customers taking their leftovers home. Half of respondents felt food waste was generated by preparing too much and they did not think that store promotions or children had much of an effect on the food waste they generated. Most establishments have their own food waste collection system and dispose food waste in their nearest bin.

As with the household respondents most in the sector felt food waste was not a problem as it is natural and biodegradable, with half agreeing that discarded food packaging had a greater environmental impact than food waste. Respondents were divided about the importance they gave to the amount of food waste they throw away, but most do try to keep it to the minimum.

Most respondents stated they could reduce their food waste if they knew how to better store or purchase food, or they knew more about the environmental impact associated with food waste. Most felt that training, a national campaign and a co-ordinated food waste collection system by the authorities would help to reduce food waste. They also agreed that solutions such as being able to take leftovers home, using smaller buffet servings or reducing portions would help to reduce food waste.

Table 30 below provides an estimate of food waste generated by food service respondents in Cameroon.

Table 30: Estimate of food waste generated, on average, by food service respondents in Cameroon, per year

Food type	Average food waste per year (kg)
Meat, chicken & fish	546
Fruit	415
Vegetables & salad	546
Cereals & bakery	468
Sweets	215
	(liters)
Fruit juice	294
Carbonated drinks	477
Milk	186
Yoghurt	135

Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.

Measures and strategies implemented to reduce food waste

Very few measures have been implemented to reduce food waste in Cameroonian households and the food service sector. Those that have, or could, focus on the agricultural component of the food chain, for example the Ministry of Agriculture and Rural Development's (MINADER) efforts to raise awareness with farmers to conserve their products and construct appropriate storage facilities to protect their food. Larger initiatives, such as the National Program of Vulgarization and Agricultural Research (PNVRA) aims to enhance the productivity of agri-pastoral and aquaculture farms, and the Agricultural Markets Investment and Development Project (PIDMA) aims to enhance the productivity and competitiveness of maize, cassava and sorghum value chains to meet agro-business demands could all incorporate food waste components.

No legislation was identified to regulate food waste. However, all businesses in Cameroon are mandated to treat their products before disposal. Whilst this is mandated it is seldom implemented. At a household level, the custom is to dry leftover or surplus food instead of throwing it away (UDA Consulting (2016).

Specific recommendations to reduce household and food service food waste in Cameroon

Based on the survey findings, and research into current interventions, the following specific recommendations to reduce household and food service sector food waste in Cameroon are suggested:

- Electricity cuts in Cameroon create issues with storage used for cooling and keeping food fresh. At a state level the inconsistency in electricity supply needs to be addressed, and on a more practical and localized level, innovations should be encouraged to identify off-grid solutions for cool storage.
- A significant proportion of Cameroon's population suffers from malnutrition. Efforts to capture food lost along the supply chain and distribute it to the less fortunate should be a priority. Structures, legislation and incentives should be put in place to encourage and enable organisations to readily distribute and donate food.
- Many Cameroonians are not aware of the impact improved storage and better shopping methods could have on reducing food waste. They are also not aware of the environmental impacts associated with food waste. As such, initiatives should be put in place to improve the knowledge of householders and the food service sector to reduce waste. This could be done through a national campaign, such as the UK's 'Love Food Hate Waste', or UNEP's 'Think.Eat.Save'.

6.3.2. Saudi Arabia

Saudi Arabia is a country spreading on an area of 214,97 million ha (FAOSTAT, 2012). Its climate is not suitable for farming as it is very dry and harsh, and the scarcity of water does not foster the agricultural production. Saudi Arabia consumes large volumes of food of which approximately 35% is wasted. More detailed contextual information and food waste survey results for Saudi Arabia are in Annex 2.

Summary of survey findings

Saudi Arabia produces one of the largest volumes of food waste in the world, approximately 1.65 million tonnes each year (Curry, 2016).

Household food waste

Most of the 111 households surveyed in Saudi Arabia have 4 or 5 members. Food shopping is usually done by fathers in supermarkets. Just over half of households check their food stocks before shopping, with the majority sometimes making shopping lists before shopping. Most meals are planned for the days ahead and are prepared from scratch. Most cook more than one type of meal at least twice a week. The majority sometimes eat frozen or convenience foods, but most prefer homemade cooked meals. Most prefer fresh food as it is considered more hygienic than pre-prepared food. This propensity for fresh food can be associated with increased volumes of food waste as it is more perishable (Abdel-Magin & Faris, 2014). Storage in rural households was considered an issue as many did not have adequate cool storage e.g. fridges to preserve food (UDA Consulting, 2016).

Food going beyond its expiry date, and purchasing too much food were the most common reasons given for generating food waste. Food promotions are likely to encourage Saudis to over-purchase. Most respondents finished all the food served on their plates, which would suggest that leftovers are not an issue. Few opened a new pack of food prior to finishing an already opened pack. Of the waste generated, responses varied as to where food waste was disposed, however most disposed vegetable peelings, coffee granules and tea bags in the nearest bin.

Bakery products are the main food types thrown away, with Saudis very rarely disposing milk and other liquids, and if they did this was down the sink.

Half of respondents were concerned about throwing food away, but were divided over the impact associated with food waste, with the majority stating they sometimes watched programmes or read articles on food waste. However, most did say they tried to keep the food they throw away to a minimum, and that they would try to reduce food if they had more information on the causes and consequences of food waste. Therefore, an increased drive to expand this knowledge through e.g. a campaign would be beneficial.

Table 31 provides an estimate of food waste generated per year by Saudi household respondents. It shows, in comparison to Cameroon, that households are in general consuming more food and therefore wasting more food at home than Cameroonians. Most food is wasted during the preparation and serving stages, with the highest volumes being for meat, eggs and

legumes; fruit and vegetables; and bread and cereals. As with Cameroon, the most common leftovers are fruit and vegetables.

Table 31: Estimated amount of food waste generated, on average, by a Saudi household, per year

Food type	Average food waste per year (kg)		
	During food preparation	Serving of food	Plate waste
Dairy products	42	41	14
Meat, eggs & legumes	78	71	22
Fruit & vegetables	84	92	30
Bread & cereals	80	70	22
Sugar & sweets	33	34	4

Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.

Food service sector food waste

94 food service establishments were surveyed, covering restaurants, bars and pubs, and coffee houses, with most operating 7 days a week.

Food service sector respondents noted the main reason for food waste generated in their establishments was due to customers leftovers, probably as a result of too large a portion size being served. Food reaching its expiry date was also reported a common cause. Most respondents felt that customer behavior was the biggest driver for food waste, and 37% felt children in particular were the main cause of food waste. In addition, food not meeting aesthetic standards (FAO, 2011a), poor stock management and the preparation of too much food in the kitchen led to an increase in food waste (European Commission, 2016). Buffets were deemed the most wasteful service option (European Commission, 2016). Almost all establishments have their own food waste collection system in which to dispose uneaten food.

As with the household respondents most Saudi food service sector respondents felt that food waste is not a problem as it is natural and biodegradable, and nearly all agreed that discarded food packaging has a greater environmental impact than food waste. However, most do think food waste is an important issue, and that it is their responsibility to reduce it. They felt that if they had an improved understanding of the environmental impact associated with food waste they would be likely to reduce it further. In terms of solutions to reduce food waste, most of the sector agreed to all the solutions proposed, particularly better menu planning and would welcome training.

Table 32 provides an estimate of food waste generated by Saudi food service respondents per year. Vegetables and salad; fruit; meat, chicken and fish are the most commonly disposed foods. Liquids contributed a significant component to the food waste thrown away. This might be due to the high consumption and perishability of these foods.

Table 32: Estimated food waste generated, on average, by Saudi food service respondents, per year

Food type	Average food waste per year (kg)
Meat, chicken & fish	87
Fruit	97
Vegetables & salad	101
Cereals & bakery	0.02
Sweets	0.05
	liters
Fruit juice	1,428
Carbonated drinks	448
Milk	2,198
Yoghurt	2,275

Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.

Measures and strategies implemented to reduce food waste

Three to four years ago, a government committee 3-4 years consisting of the Ministries of Agriculture, Health and Commerce, and the Saudi Food and Drug Association (FDA), was formed to deal with the issue of food waste. However, no specific outcomes from this initiative could be identified (UDA Consulting, 2016a). Most food waste related activities in the country tend to be co-ordinated by religious NGOs.

A relatively sound municipal solid waste management (MSW) system does exist in the country. Solid waste is collected in large bins situated in commercial and residential areas. Collected waste is handled at transfer stations prior to being sent to landfill sites. Food waste represents approximately 37% this waste collected.

Specific recommendations to reduce household and food service food waste

Based on survey findings, and research into current interventions, the following Saudi-specific recommendations to reduce household and food service sector food waste are suggested:

- As Saudi Arabia has a good MSW system in place, the introduction of facilities to separate food waste should be considered, and incentivized. Food waste collected can be composted with the infrastructure provided to do so.
- Cultural drivers, such as the stigma associated with taking leftovers from restaurants indicates that awareness raising campaigns and reduction initiatives should be implemented to educate and encourage citizens to change their behavior. A respondent suggested that this could be along the same lines as the 'Seat belt' campaign run in the country. In addition, the campaign should focus on how to better purchase and cook food, and use leftovers.
- Many respondents noted that buffets generated the most food waste. This format of serving food should be improved or limited.

- To further reduce the impact of food waste generated during religious activities, imams and mosques should be encouraged to preach or deliver sermons on Friday (Khutbah) on food waste.

6.3.3. Turkey

Turkey is a major agricultural producer due to its climate and land nature that are suitable to produce many products. About 50.6% of the country consists of agricultural lands. In 2015, the total area of agricultural lands covered more than 239 million decare.

Fruit and vegetables are the largest contributing food type to total food waste in Turkey. Further contextual information on Turkey and detailed food waste survey data can be found in Annex 2.

Summary of survey findings

Household food waste

Most of the 110 households surveyed in Turkey have 4 members. Most food shopping is done by fathers in supermarkets, with most checking their food stocks before food shopping, with the majority making shopping lists beforehand. Most meals are planned a day ahead and are prepared from scratch, with few eating frozen or convenience foods. Over half of respondents cook more than one type of meal at least four days a week. Most respondents prefer to make their meals at home, rather than eat out.

Food going beyond its expiry date was the most common reason given for generating food waste. Food promotions do encourage over-purchase, with fruit, vegetables and bakery products the main items over-purchased and subsequently thrown away. As with Saudis and Cameroonians very little milk and other liquids are wasted, and if they are they are mostly poured down the sink. Confusion exists around 'best before' and 'use by' dates.

Most respondents were concerned about throwing food away, and acknowledged it was a problem, but had little knowledge of the associated impacts. This finding is supported by work undertaken by Pekcan (2006). Respondents stated that they would consider reducing food waste further if they had more information on how to better store food and shop more effectively to avoid food waste. With few respondents referring to watching programmes or reading articles on food waste, this would not be an appropriate mechanism for disseminating information - the survey did not capture what would be the most appropriate avenue.

Table 33 provides an estimate of food waste generated in Turkish households per year. It shows that most food is wasted during the preparation and serving stages, with the highest volumes for meat, eggs and legumes; fruit and vegetables; and bread and cereals.

Table 33: Estimated food waste generated, on average, by a Turkish household, per year

Food type	Average food waste per year (kg)		
	During food preparation	Serving of food	Plate waste
Dairy products	195	191	4
Meat, eggs & legumes	136	132	3
Fruit & vegetables	282	268	4
Bread & cereals	113	106	3
Sugar & sweets	58	57	1

Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.

Food service sector food waste

100 food service establishments were surveyed, covering 56 restaurants, 10 bars and pubs and 15 coffee houses. The majority operate 7 days a week.

Turkish food service sector respondents noted the main reason they generated food waste was due to customers over-ordering, with 37% noting that children were particularly responsible for food waste. As with Saudi Arabia, respondents felt that buffets were the most wasteful service option. Less than 15% of their customers request to take away their leftovers. This correlates with the Turkish household survey findings, in which most respondents were not concerned about taking leftover food home.

Most establishments do to not have their own food waste collection systems, with most feeding food waste to animals (probably on the street). However, food waste such as tea and coffee granules are thrown away in the bin. 10% donate food to charities or it is collected by a dedicated food waste collector. The majority dispose liquid food waste down the sink.

Most respondents were concerned about food waste, but felt they could have their knowledge on the issue improved, and would welcome training to do so. A national campaign to reduce food waste would also be welcomed. Respondents also requested local authorities put in place suitable waste management systems for the collection of food waste.

Table 34 provides an estimate of food waste generated by Turkish food service respondents per year. Vegetables and salad; and meat, chicken and fish are the most common foods thrown away, with fruit juice the largest liquid category thrown away.

Table 34: Estimated amount of food waste generated, on average, by food service respondents in Turkey, per year

Food type	Average food waste per year (tonnes)
Meat, chicken & fish	1.5
Vegetables & salad	1.5
Fruit	0.4
Cereals & bakery	0.7
Sweets	0.1
	liters
Fruit juice	692
Carbonated drinks	619
Milk	3
Yoghurt	0.3

Source: Field survey results: Cameroon, Saudi Arabia & Turkey: 100 household and 100 food service establishments; Afghanistan, Benin, Senegal and Uzbekistan: 20 household and 20 food service establishments.

Measures and strategies implemented to reduce food waste

A number of initiatives were identified to reduce food waste in Turkey e.g. the Turkey Waste Prevention Foundation (TISVA) - an NGO established in 2010, aims to ensure the efficient and

effective use of resources and prevention of waste including foods in the community (FUSIONS, 2016). Among its activities, one significant achievement was the establishment of the Food Banking Association, which delivers surplus food to people in need. Its headquarters are in Istanbul from where partner food banks, associations, retailers and the food industry activities are co-ordinated (FUSIONS, 2016a). Furthermore, there are laws in Turkey to encourage businesses to donate food, with the provision of a tax incentive to do so.

As previously mentioned, Turkey launched a 'Preventing Bread Waste' campaign in 2013. The campaign relies on the voluntary co-operation of all state foundations and establishments, local administrators, the Food Banks Association, universities, NGOs and the private sector (FUSIONS, 2016). The campaign is targeted at bakeries, restaurants, hotels, cafeterias and households, in which bread waste is the most frequent.

Whilst not indirectly linked to, but could be used as a conduit for incorporating food waste, three other initiatives are of interest exist:

- The government's State Planning Organization's 'Working Committee Report for National Food and Nutrition Strategy of Turkey' and 'National Plan of Action for Food and Nutrition' (NPAFN) (Pekcan, 2006). With it now widely acknowledged that sustainable diets should encompass issues of food waste, there could be an opportunity for the authorities to include the reduction of food waste into this strategy (as per Qatar's Nutritional Guidelines).
- Turkish agricultural policies have undergone a significant process of reform, with the Ministry of Food, Agriculture and Livestock developing a 'Strategic Plan 2013-2017' (FAO, 2013). The plan covers food production and security. As food security is inextricably linked with food waste, this is an important activity with which to engage on the issue of food waste.
- In relation to food supply chains, regulations have been developed, in accordance with EU regulations, to promote good storage to reduce waste (FAO, 2013).

Recommendations to reduce household and food service food waste in Turkey

Based on survey findings, and research into current interventions, the following recommendations to reduce household and food service sector food waste in Turkey are suggested:

- To build on and expand current food waste initiatives described above.
- Identify opportunities to collaborate and integrate household and food service policies, legislation and initiatives within broader national health and agricultural policies and plans.
- Many food service sector respondents noted that buffets generated the most food waste. This format of serving food should be improved or reduced to decrease food waste.
- The use of meal leftover bags by restaurants should be encouraged to reduce customer food waste.

7. POLICY RECOMMENDATIONS

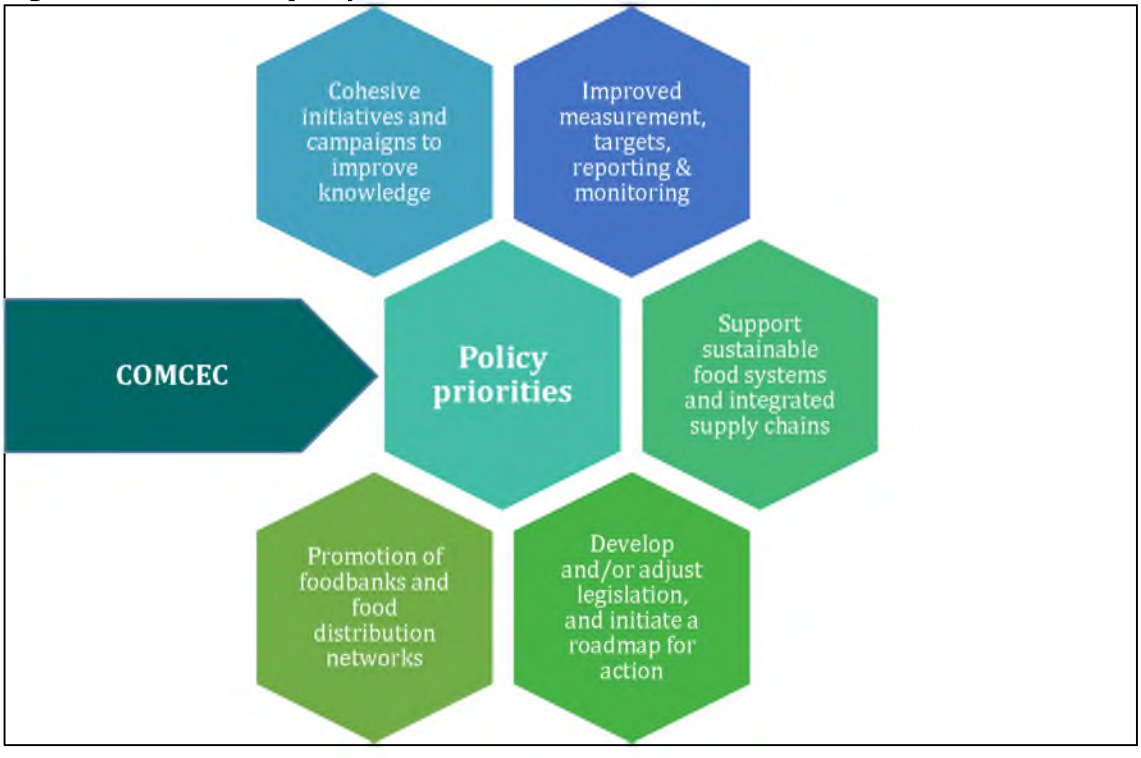
This section outlines some key policy recommendations based on the findings of the research. These recommendations provide a course of action that should be adopted or proposed by COMCEC and wider stakeholders operating in the OIC Member Country food supply chains – such as retailers, producers and processors, civil society and NGOs – to reduce food waste.

It is recognised that food waste is a complex issue, and as such it is recommended that collaboration with stakeholders is undertaken to ensure policies that are developed and implemented are fit for purpose for all those operating along the food supply chain. This should aid in the success of food waste reduction at scale, whilst recognizing the uniqueness of each country and its cultural and social dynamics.

Key policy recommendations proposed for consideration are:

- Improved measurement, targets, reporting and monitoring.
- Support sustainable food systems and integrated supply chains.
- Develop and/or adjust legislation, and initiate a roadmap for action.
- Promotion of foodbanks and food distribution networks.
- Cohesive initiatives and campaigns to improve knowledge and awareness.

Figure 24: Overview of policy recommendations



Source : UDA Consulting Analysis

7.1. Improved measurement, targets, reporting and monitoring

Accurate estimations of the extent of food waste in OIC Member Countries is lacking, particularly in developing countries. Whilst this data is lacking, and this study begins to explore and fill this gap, the FAO argues that this does not undermine the current situation, that food waste remains unacceptably high (FAO, 2015). Whilst organisations, such as the FAO have undertaken ground-breaking research into estimating the extent of global and regional food waste, these are estimates. They acknowledge why there is a need to improve our understanding of the extent of food waste at a country- and or regional-level as food waste is dependent on specific conditions and local situations, such as culture. For this reason, and the lack of data, within and on OIC Member Countries it is recommended that:

1. COMCEC builds on this current piece of work to further undertake research to measure and understand the scale of OIC Member Country-specific food waste rates, why these occur (causes and behaviors) and where in the supply chain. The focus should include households and the food service sector, and the gathering of actual as opposed to estimated data.
2. Either with the guidance from COMCEC or individual OIC Member Country action, individual country-wide studies should be undertaken.

It is recommended that the methodology(ies) used to calculate and report on the scale of food waste by OIC Member Countries is credible, consistent and practical. For this reason, it is advised that COMCEC encourage member states to adopt, adapt or be guided by the WRI's 'Food Loss & Waste Protocol' and 'Standard' (WRI, 2016). Training is offered by the WRI on how to adopt and implement the protocol and standard. In addition, UNEP's Thik.Eat.Save's guidelines for calculating food waste should also be taken into consideration.

This research creates an evidence-base from which to develop a benchmark for setting realistic country-specific or a COMCEC collective target or targets for reducing food waste in households and the food service sector. These targets can be guided and adapted from initiatives that are already in existence, for example the UN's Sustainable Development Goal (SDG) 12.3, which aims to "halve per capita global food waste, by 2030, at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses" (Champions123, 2016b). Larger entities operating in the food chain should be encouraged to engage with and become Champions of 12.3.

In addition, it is recommended that to increase the awareness of food waste, the data gathered should be published to attract attention to what data is available, and where data improvements could be made, or gaps filled.

7.2. Support of sustainable food systems and integrated supply chains

Whilst the focus of this research is on food waste in households and the food service sector, it is imperative that this component of the supply chain is not isolated in terms of initiatives to reduce food waste. Any actions to reduce food waste in this stage of the food supply chain need to take into consideration the wider context of the food supply chain. For example – working

with packaging manufacturers to develop solutions to extend food shelf-life at home, or exploring innovations with food distributors to improve their cool storage to ensure products reach the consumer in a state which improves longevity of the product.

Within the wider context of food, and its role in society, food waste within a food system needs to be considered (this is a more circular and wider encompassing concept than the linear model of a food supply chain). For example, it encompasses issues such as the environmental and social impacts associated with the production, processing, delivery, retail, consumption and disposal of food; as well as the nutritional value of food – some term this 'sustainable diets'. Garnett (2014) argues that our diets need to change as "what, and how much we eat directly affects what, and how much is produced. We therefore need to consume more 'sustainable diets'– diets that have lower environmental impacts, and are healthier" (Garnett, 2014, p4). Qatar has produced globally ground-breaking legislation to encompass sustainable diets in its nutritional guidelines for the country (Seed, 2014). It is highly recommended that COMCEC review these guidelines for suitability and adaptability by its members, and to encourage wider implementation of similar initiatives member countries.

Moving on from the concept of 'sustainable diets', discussions on 'sustainable food systems' is coming to the fore as a preferred concept for deliberation and implementation. It is used by organisations such as the FAO and UNEP as an umbrella under which activities to promote sustainability along the food value chain are considered in unison (UNEP, 2015). Sustainable food systems should encompass some of the following characteristics:

- It is secure, healthy and safe, and environmentally beneficial or neutral and therefore reliable and resilient to change (including climate change, rising energy prices, etc) and accessible and affordable to all members of society.
- Is an economic generator for farmers, whole communities and regions.
- Balances food imports with local capacity, and supports urban and rural food production.
- Addresses price and subsidy distortions, ensuring a fair-trading market including fair wages and fair access to food.
- Adopts regionally-appropriate agricultural practices and crop choices.
- Contributes to both community and ecological health, for example builds soil quality and farmland through the recycling of organic waste.
- Incorporates nutritional guidance and population well-being.
- Has a strong educational focus to create awareness of food and agricultural issues. (Capone et al., 2016; CRC Research, n.d.; FAO, 2015; Garnett, 2014).

It is recommended that COMCEC build on this research and consolidate a review of activities being undertaken in member countries to ascertain the level of engagement and implementation against these sustainable food system criteria in order to identify areas of commonality, the main actors and stakeholders, and activity gaps. From this, examples of good practice can be shared among member countries to develop and implement more holistic sustainable food systems, rather than focusing on individual elements. Other global initiatives, such as those adopted by Australia, the UK and the Netherlands have set the precedent for aligning diets and

sustainability (Commonwealth of Australia, 2013; Gezondheidsraad, 2011; SD Commission, 2009). An assessment of these initiatives, how they have been developed, facilitated and implemented can be used to guide any sustainable food system dialogue and activities proposed by COMCEC and its member states.

It is recommended COMCEC convene and co-ordinate a forum of selected stakeholders to develop OIC Member Country-specific policies on sustainable food systems. From this assessment, a roadmap for future action can be develop.

7.3. Development of legislation and a roadmap

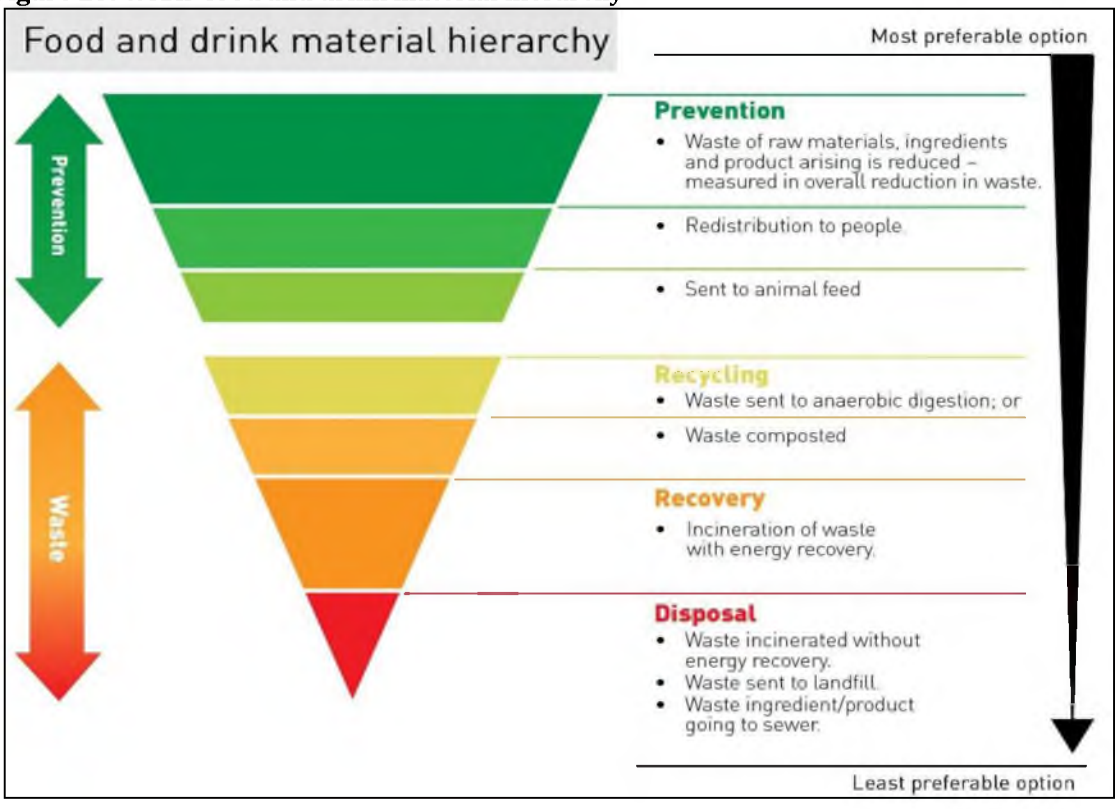
The research clearly demonstrates that food waste legislation across the OIC Member Countries is limited or lacking. There are examples of leadership in this area e.g. Qatar's dietary guidelines, Turkey and Egypt's bread waste reduction laws, Pakistan's 'one-dish law' and Indonesia's 'Law on Food'. The rest, if they do have legislation, focus on solid waste management, which includes organic waste such as food. This legislation tends to prioritise disposal activities and recycling. However, in many instances not even this basic level of legislation is implemented, or it is fragmented and inadequately monitored or adhered to. Two of the main reasons for where this is evident is in war-torn areas, and less-developed and poor OIC Member Countries.

As a first step, COMCEC should produce a basic set of principles for drafting legislation on solid waste management for its members that is cost-effective and feasible for the diverse range of countries within its membership-base. This should be accompanied by a recognition that financial aid might be required in some situations to not only develop this legislation, but more importantly develop and build the infrastructure and systems to support the implementation of the legislation. This might be in the form of co-ordinated access to funding, or provision of funding among the nations or international community.

With the development or review of any legislation the food waste hierarchy should be incorporated as a matter of principle. This will ensure that all food is adequately separated from the waste stream and can ultimately, and where feasible, be made available for human consumption. All stakeholders operating within the food supply chain should see it as their duty of care to adopt the food waste hierarchy, prevent waste and apply the waste hierarchy when they transfer waste. An example of such a hierarchy has been developed by WRAP (see Figure 25).

It is recommended that COMCEC provide information and guidance which sets out steps for dealing with food waste to minimize the impact on the environment in relation to the hierarchy. This guidance can be supported by the evidence-based research recently commissioned by COMCEC on post-harvest food waste, and this research. A tailored on-line tool could also be an appropriate mechanism for distributing guidance, and keeping stakeholders informed of developments, latest research and examples of best practice.

Figure 25: WRAP food and drink material hierarchy



Source: WRAP (2016)

Review and adoption of legislation to reduce food waste

It is recommended that two activities associated with the implementation of legislation to reduce food waste are considered:

1) **A more in-depth review of OIC Member Country food label legislation** to ensure current label requirements do not unnecessarily confuse the consumer. Legislation should encourage clear, understandable labelling to ensure products are eaten by the 'use-by' and not 'best-before' dates, and correct storage and cooking practices information on labels is clear and adopted.
2) **Consideration and adoption of legislation to ban supermarkets from throwing away or destroying unsold food** as per the French government's law to encourage distribution of surplus food to charities and/or food banks.

7.3.1. Development of a member state food waste reduction roadmap

To guide the development, revision and implementation of legislation on food waste (or that which incorporates food waste) it is recommended COMCEC develop a roadmap for reducing food waste to meet the Sustainable Development Goal 12.3 by halving food waste by 2030. The forum proposed to co-ordinate dialogue and implement activities to achieve a sustainable food system would be a suitable forum to undertake this exercise.

The aim of the roadmap would be to align and co-ordinate existing member state policies and activities to reduce food waste, and to disseminate best practice amongst the member states. A unified OIC Member Country policy and principles document could be developed to aid Member Countries to set their own national guidelines. This could help boost investment from international and country-specific businesses and institutions. Based on a recommended target to halve food waste by 2030, a set of focused plans and actions can be agreed on and put in place to meet interim targets. These targets could include the prioritization of:

- Developing a forum or platform for sharing best practice.
- Developing an overarching set of guidelines and principles for developing and implementing national-level and/or regional policies.
- Agreeing on and developing a standardized methodology for calculating and reporting food waste.
- Setting in place regulations and tax incentives to encourage and enable businesses to easily and cost-effectively donate surplus food (such as in Italy and France).
- Investigate the feasibility of implementing bans or limitations on the provision of excessive food at events, such as weddings.
- Seeking alternatives to state subsidies for food items, such as bread, or revising the legislation and implementation of the subsidies to ensure that food is not unnecessarily distributed and wasted.
- Development of a staged member state campaign, which can be adapted by each member state, to raise awareness around the issues of food waste, and provide guidance to householders and the food service sector on how to reduce food waste.

It is recommended that COMCEC consider developing and implementing agreements (these could be voluntary) and/or commitments Member Countries, and relevant stakeholder organisations and institutions within these countries, can sign up to and register their commitment to reducing and reporting on food waste. These could be similar to, for example WRAP's 'Courtauld 2025' or 'Hospitality and Food Service Agreement' (WRAP, 2016). In addition, alignment with and drawing on UNEP, WRAP and the FAO's 'Guidance on the Prevention and Reduction of Food and Drink Waste' to map and develop targets would be beneficial.

7.4. Promotion of food banks and food distribution networks

One of the key successes, both globally and within OIC Member Countries, has been the setting up of food banks and food distribution networks. These initiatives provide an important role in the distribution of unwanted food to the needy in countries suffering poverty and or affected by war.

A recommendation is for COMCEC to further promote the Egyptian-based food bank model, and share best practice throughout its member states, thereby encouraging the adoption of food banks in countries where these do not exist. While food waste prevention is a priority, the distribution of food that is being unnecessarily wasted can be accommodated through these networks. In addition, such measures also aid in the alleviation of access to food, and therefore can help towards reducing food security issues.

Any efforts to expand food banks and food distribution networks should be done in partnership and consultation with the Arab Food Bank Regional Network (FBRN).

7.5. Cohesive initiatives and campaigns to improve knowledge

What became very apparent when analyzing the survey responses, was a significant proportion of the respondents had little concern for food waste, yet noted if they had access to further information on the environmental impacts associated with food waste, and the provision of solutions on how to reduce food waste e.g. through improved shopping practices, this would encourage them to reduce food waste. This applied to both households and the food service sector. Taking this into consideration, the implementation of a consumer campaign should be a priority for COMCEC.

This report has identified a variety of campaigns and initiatives adopted internationally and by member states to reduce food waste. Any future consolidated campaign should aim to draw on the experiences of these initiatives, learn from and develop guidelines and principles for member countries to co-ordinate the development, implementation, evaluation and monitoring of their own specific campaigns which acknowledge their unique cultural and social dimensions.

It is highly recommended that COMCEC draw on the experience of global initiatives, and where appropriate collaborate and engage with e.g. UNEP or the FAO to develop COMCEC's campaign plan. Again, the Sustainable Food System forum proposed earlier could be a useful space to propose and develop such a campaign.

Any campaign proposed should provide practical support to stakeholders along the food supply chain e.g. businesses, local authorities and consumers to create an environment where guidance, learning and initiatives can be shared effectively and efficiently.

Excessive food waste generated at communal events, such as weddings are of concern to OIC Member Countries. As such, any campaign needs to accommodate this cultural dimension, and religious stakeholders should also be involved in the development of material and dissemination of key messages e.g. during Friday prayers.

In conclusion, several policies have been recommended based on the findings of the research, and draw on evidence from international work and activities in this space. Too often policy implementation fails as it is not practical, cost-effective, beneficial to the user or disparate. It is therefore recommended that COMCEC ensures that whatever policies are considered for adoption, these should be cohesive, with a preference for a consolidated and umbrella sustainable food system policy as the overarching aim, and that development is consultative and draws on the good work that is already being undertaken in member countries.

8. CONCLUSIONS

The picture emerging from this study is one of diversity among the member countries, most notably levels of poverty and wealth (in the extremes), climatic differences, political stability (many countries are war-torn) and level of engagement with the topic of food waste through the implementation of initiatives to reduce food waste (from nil to global leaders). It has become evident that these variables significantly impact on the volumes of food waste generated and diverted by households and the food service sector.

Prior to this study, a consolidated understanding of the scale and causes of food waste in the OIC Member Country households and the food service sector was limited and *ad hoc*. This study has gone some way to providing an indication of the extent of food waste generated by OIC Member Countries and fills in some of the gaps. However, it has not been possible to provide a robust estimate of total food waste generated by all OIC Member Countries, as very few countries have undertaken country-specific assessments. What was possible to ascertain was:

- Estimates, based on FAO data, of the extent of food waste for the global geographical regions, within which OIC Member Countries are situated.
- Estimates, based on in-depth surveys, of food waste generated per week and year by households and the food service sector in Afghanistan, Benin, Cameroon, Saudi Arabia, Senegal, Turkey and Uzbekistan.

8.1. Key findings

The extent of food waste generated in households and the food service sector was derived from data gathered from seven survey countries: Afghanistan, Benin, Cameroon, Saudi Arabi, Senegal, Turkey and Uzbekistan. Data presented is indicative of the practices adopted in a sample set of the 57 OIC Member Countries, and therefore is not a full reflection of all member countries. However, it does provide a good platform from which to develop policies for action and further improve future research.

Household food waste

Family-size is a significant factor for the amount of food waste generated, with some OIC Member Country households having 8-10 members.

Households most commonly threw away fruit, vegetables and bakery products. Milk is rarely discarded, and if so, it is poured down the sink. The main products disposed of by the food service sector were fruit, vegetables and salad, meat, chicken, fish and milk.

Interestingly, in comparison to European studies such as WRAP's 'Household Food Waste Survey', most of the shopping is done by fathers, whilst in more Western- and European countries it is done by women or mothers.

With respect to the data gathered, it should be noted that there were some major disparities. This is likely due to respondents providing estimates as opposed to actual measured food waste. In many of the surveyed countries, respondents were likely to have low levels of literacy e.g.

Senegal, or a poor understanding of metrics e.g. kgs and waste generated overtime. It is therefore important to interpret the data with caution, and see it as indicative of practices.

It was also not possible to derive the average volumes generated for the total 57 OIC Member Countries using the data gathered. The main reason being that the data gathered, whilst an excellent start, is based on only 7 countries. However, this data does provide very useful and indicative insights from which to draw conclusions, propose policy recommendations and to illustrate the diversity, causes and behaviors leading to food waste among householders and the food service sectors in member states.

8.1.1. Main causes of food waste

Within **households**, the research suggests the main causes for food waste were related to concerns about food poisoning or food reaching its expiry date, and cooking or serving too much food. Whilst many households noted they do use shopping lists and plan meals in advance, there was still a tendency to over-purchase, and this was sometimes down to the influence of promotions.

For the **food service sector**, the reasons indicated were too much food being prepared (e.g. unsure of customer numbers), food reaching its expiry date, customers ordering too much food, and the stigma associated with taking home leftovers. Many felt their customers' behavior was the biggest driver for food waste, with a number referencing children's eating habits as a cause. Buffets as a serving option created the most food waste for all respondents.

8.1.2. Measures and initiatives to reduce food waste

This study is not the first, it is a consolidation and investigation of studies that have been done in and on OIC Member Countries in the preceding years. It builds on initiatives and research, and identifies those that stand out as examples of good practice – both internationally, and within the member countries – and proposes how these opportunities can either be cascaded and implemented more widely through the member countries. In addition, the research identified gaps, or barriers to implementation e.g. stigma associated with taking home leftovers, state subsidies for bread, or lack of waste management infrastructure – and provided policy recommendations to overcome these issues.

There are numerous international initiatives Member Countries can collaborate with and draw on for inspiration and guidance – such as 'Champion 12.3', UNEP's 'Think.Eat.Save', WRAP's 'Love Food Hate Waste' campaign and the FAO's 'Save Food'. The same applies for country-specific or regionalized initiatives, such as the Arab Food Bank Regional Network (FBRN), Qatar's 'National Dietary Guidelines', or Turkey's bread waste campaign.

The role of COMCEC would be to recognize, build on and learn from these initiatives to consolidate, share good practice and develop policies which are unique and applicable to its members.

8.2. Policy recommendations

The recommendations proposed provide a course of action for COMCEC and its member countries. Food waste is a complex issue, and as such policies should be developed in collaboration with stakeholders to ensure they are fit for purpose, and recognised the unique political, social and cultural dynamics of the countries represented. The following policy recommendations are proposed:

- **Improved measurement, targets, reporting and monitoring:** COMCEC should build on this study to further measure and understand the scale of food waste in additional OIC Member Countries, or encourage individual member states to undertake their own studies to develop a more robust set of data and to give a truer reflection of the extent of food waste. Methodology(ies) used should adopt or be guided by the WRI's 'Food Loss and Waste Protocol' and 'Standard'.
- **Support sustainable food systems and integrated supply chains:** Any actions to reduce food waste in households and the food service sector should consider the wider context of food and its role in society within a broader food system. It should encompass issues such as the environmental and social impacts associated with the production, processing, delivery, retail, consumption and disposal of food. This could include, for example, incorporating food waste into national dietary guidelines (as per Qatar), or collaborating with UNEP on their 'Sustainable Food Systems Program'.
- **Develop and/or adjust legislation, and initiate a roadmap for action:** Food waste legislation across the OIC Member Countries is limited or lacking. It is recommended COMCEC produce a basic set of principles for drafting legislation on solid waste management that acknowledges the food waste hierarchy. In addition, COMCEC should review food label legislation to ensure current label requirements do not unnecessarily confuse the consumer. It is proposed that an overarching member state food waste reduction roadmap is developed to meet the Sustainable Development Goal 12.3 of halving food waste by 2030. A forum of stakeholders is proposed to guide the development and implementation of such a roadmap.
- **Promotion of food banks and food distribution networks:** Food banks are a success story within many OIC Member Countries. It is recommended COMCEC further promote the Egyptian-based food bank model, and share this among its member states in collaboration with the Arab Food Bank Regional Network (FBRN).
- **Cohesive initiatives and campaigns to improve knowledge:** The evidence is clear, those interviewed felt they would reduce food waste further if they had more knowledge of the issue. This highlights the need for COMCEC to co-ordinate a household and the food service sector food waste reduction campaign.

In conclusion, there is a role for COMCEC to play in reducing food waste in households and the food service sector. Some excellent examples of good practice exist that can be shared and learnt from, and international collaborative efforts to engage with. The journey is complex due to the huge variations in political, social and economic dimensions of the various countries, however this also provides an opportunity for some who are starting from new to incorporate food waste reduction principles into new legislation or initiatives, whilst those showing leadership are encouraged and supported to continue to do so and share their experiences.

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ANNEX 1: LIST OF THE MEMBER COUNTRIES ACCORDING TO THE 3 OIC REGIONAL GROUPS

Arab group	Asian group	African group
Algeria	Afghanistan	Benin
Bahrain	Albania	Burkina Faso
Comoros	Azerbaijan	Cameroon
Djibouti	Bangladesh	Chad
Egypt	Brunei Darussalam	Cote d'Ivoire
Iraq	Indonesia	Gabon
Jordan	Iran	Gambia
Kuwait	Kazakhstan	Guinea
Lebanon	Kyrgyz Republic	Guinea-Bissau
Libya	Malaysia	Mali
Mauritania	Maldives	Mozambique
Morocco	Pakistan	Niger
Oman	Tajikistan	Nigeria
Palestine	Turkey	Senegal
Qatar	Turkmenistan	Sierra Leone
Saudi Arabia	Uzbekistan	Togo
Somalia	Guyana*	Uganda
Sudan	Suriname *	
Syria		
Tunisia		
United Arab Emirates		
Yemen		

** Guyana and Suriname are in the Latin America Region. However due to the limited number of countries in that region, they are included in the Asian Group.*

ANNEX 2: CASE STUDIES: CAMEROON, SAUDI ARABIA AND TURKEY

1. STATUS AND IMPORTANCE OF AGRICULTURE IN THE COUNTRY

1.1 Cameroon

Agricultural production

Cameroon is a country of 475,650 km characterized by an agro-ecological diversity offering it a wide range of agricultural, pastoral and halieutic products. The northern region is arid with low rainfall and cotton as well as rain fed subsistence cereals like millet, sorghum, beans, wheat, groundnut or corn are grown. This is also the region where nomadic/semi-nomadic pastoralists raise cattle. The southern region is ideal for the cultivation of tubers. There is an intermediary zone, between the north and the south, where coffee, bananas, root crops and plantains are cultivated. The coastal zone is characterized by high rainfalls and fertile soils, as well as many forests, and is the region where palm oil, rubber and horticultural crops are produced (FAO, 2012 & 2014c; World Bank, 2014).

About 20% (i.e. 7.2 million ha.) of the country consists of agricultural lands and 13% consists of arable lands whom only 51% are cultivated (i.e. around 1.8 million). 240.000 ha. of lands are irrigable and only 33.000 ha. are irrigated (i.e. 17% of its potential) (FAO, 2013b; World Bank, 2014). Main agricultural items produced in Cameroon are referenced in the table below:

Table 1: Commodities produced in Cameroon in 2012

Commodity	Production (U$ 1,000)	Production (M Tonnes)
Plantains	712,280	3,450,000
Cassava	394,870	4,287,177
Bananas	394,283	1,400,000
Tomatoes	325,216	880,000
Meat indigenous, cattle	300,221	111,136
Cocoa, beans	265,853	256,000
Taro (cocoyam)	254,504	1,614,103
Groundnuts, with shells	242,354	633,799
Beans, dry	214,698	342,896
Maize	162,716	1,749,976
Meat, game	144,695	66,500
Oil, palm	140,088	230,000
Vegetables, fresh (nes.)	131,909	700,000
Sorghum	131,133	1,102,000
Cotton lint	115,051	80,500
Yams	106,098	537,802
Meat indigenous, chicken	99,996	70,202
Coffee, green	69,833	65,000
Rubber, natural	64,055	56,000
Meat indigenous, pig	62,258	40,500

Source: FAOSTAT (2013)

Population

Cameroon's population is estimated around 23 million inhabitants whom 51% are women. The population is growing at an average annual rate of 2.8% and is expected to reach more than 26 million people by 2020. Cameroon is subject to the urbanization of its population. Indeed, urban population is growing more quickly than the national average, at a rate of 5,7%. The rural population is growing at a rate of only 1,3% and decreased from 53% of the total in 2001-2005 to 42% today (58% of the population living in urban areas today) (FAO, 2013b; World Bank, 2015).

In 2012, 40% of Cameroon's population (i.e. 8 million people) was still poor, living with less than 22.500 FCFA/month (i.e. $ 40/month or $ 1.30/day). This poverty rate has remained stable over the last decade, from 40.2% to 39.9% (FAO, 2013b). Poverty is localized more in the rural areas with 55% of the households being poor compared to 12% in urban areas, and 87% of the people living in rural areas are still poor (Fongang, 2012).

Self-sufficiency

Cameroon's food and cereal deficiency do not allow it to cover the needs of its population. The imports of food items essential to cover the needs of human and animal feeding represent around 20% of the imports (FAO, 2013b).

In rural areas, 10% of the population (i.e. 1 million) is in a situation of food insecurity, not having a physical and economical access to a sufficient, healthy and nutritive food allowing them meet their energy needs and satisfy their food preferences (FAO, 2013b), and therefore suffer from undernourishment and malnutrition. In total, 20% of the population (i.e. 4 million Cameroonian) were undernourished in 2011 according to the WFP (FAO, 2011).

Agricultural activities' contribution to Cameroon's economy

Representing around a quarter of the GDP (around $ 25 billion (Fongang, 2012)) and generating half the income of non-oil exports, the agricultural sector plays an important role in the economy of the country (oil exports represent 54,5 % of total exports) (FAO, 2013b; Ministry of Agriculture, 2015). 63% of the population of Cameroon is involved in the agricultural sector and 70% depend on it for its survival. In the rural areas, 90% of the populations are involved in a rural economic activity and one-third of these get an income from cash crops (Ministry of Agriculture, 2015).

Trade statistics

The tables below present Cameroon's main imported commodities (not only agricultural products) and main exported commodities (not only agricultural products).

Table 2: Commodities imported in Cameroon in 2011

Commodity	Quantity (tonnes)	Value (U$ 1,000)	Unit value (US$/tonne)
Wheat	416,925	178,888	429
Sugar refined	90,390	74,695	826
Malt	67,915	53,411	786
Food prep (nes.)	19,719	36,150	1,833
Milk whole cried	8,651	35,558	4,110
Cigarettes	3,542	35,147	9,923
Palm oil	21,300	26,857	1,261
Infant food	3,094	19,163	6,194
Cake of soybeans	29,238	15,860	542
Flour of maize	16,234	12,642	779
Wine	11,994	12,025	1,003
Macaroni	13,907	11,980	861
Food prep, flour, malt extract	11,390	9,260	813
Sugar confectionery	7,492	8,423	1,124
Flour of Wheat	12,445	8,152	655
Pastry	4,174	8,006	1,918
Food wastes	6,147	7,475	1,216
Margarine short	6,811	6,593	968
Offal of pigs, edible	2,982	6,344	2,127
Grape juice	4,145	6,244	1,506

Source: FAOSTAT (2012)

Table 3: Commodities exported by Cameroon in 2011

Commodity	Quantity (tonnes)	Value (U$ 1,000)	Unit value (US$/tonne)
Cocoa beans	190,214	512,183	2,693
Cotton lint	55,803	113,934	2,042
Rubber nat. dry	25,447	105,558	4,148
Bananas	237,275	88,672	374
Coffee, green	30,842	72,176	2,340
Cocoa butter	7,812	30,577	3,914
Cocoa paste	7,.093	27,404	3,864
Food prep (nes.)	10,200	26,106	2,559
Natural rubber	6,627	25,671	3,874
Cocoa powder & cake	5,815	21,731	3,737
Chocolate	2,878	12,152	4,222
Palm oil	5,003	9,840	1,967
Beverages (distilled alc.)	5,941	8,296	1,396
Vegetables preserved (nes.)	3,544	5,452	1,538
Sugar confectionery	1.414	4,675	3,306
Sugar refined	4,116	4,144	1,007
Milk whole dried	580	3,907	6,736
Beer of barley	4,088	3.096	757
Pineapples	10,005	2,261	226
Pastry	1,346	1,774	1,318

Source: FAOSTAT (2012)

1.2 Saudi Arabia

Agricultural production

Saudi Arabia is country spreading on an area of 214,97 million ha (FAOSTAT, 2012). Its climate is not suitable for farming as it is very dry and harsh, and the scarcity of water does not foster the agricultural production. Therefore, Saudi Arabia's agriculture has historically been a small-scale practice however it has been supported by the government for the last four decades. Saudi Arabia increased its agricultural production until the 1990' thanks to strong technological investments but decided to decrease it since then because of the need to manage decreasing water resources (agriculture has counted for 85% of the of the country's water consumption) (Al-Shayaa, Baig & Straquadine, 2012). Added to the water scarcity and difficult climate conditions, there is a lack of arable land preventing large scale agriculture. Today the arable land area represents only 3.16 million ha. and permanent crops represent an area of only 0.23 million ha (almost 2% of the country consists of arable land, only) (FAOSTAT, 2013; Lovelle, 2015). The country mainly produces the items referenced per their quantity and their value in the tables presented below.

Table 4: Top ten commodities production quantity in 2012

Commodity	Quantity (Tonnes)
Milk, whole fresh cow	1,750,000
Dates	1,050,000
Wheat	780,000
Vegetables, fresh (nes.)	625,000
Meat indigenous, chicken	572,270
Tomatoes	525,000
Potatoes	450,000
Fruits, fresh (nes.)	415,500
Watermelon	370,000
Sorghum	265,000

Source: FAOSTAT (2013)

Table 5: Top ten commodities production value in 2012

Commodity	Value (U$ 1,000)
Meat indigenous, chicken	815,145
Milk, whole fresh cow	546,107
Dates	536,239
Tomatoes	194,021
Eggs, hen, in shell	182,466
Wheat	168,827
Fruits, fresh (nes.)	145,024
Meat indigenous, cattle	134,212
Vegetables, fresh (nes.)	117,776
Meat indigenous, sheep	112,070

Source: FAOSTAT (2013)

Population

Saudi Arabia is a country of 31.540.000 inhabitants (United Nations, 2015a). By 2050, the total population is expected to grow by 77% (Lippman, 2010). The median age is 26, so the population is quite young, and it is expected to live until 75 (UNSD, 2015). This means many challenges to address and feed a growing population.

Demographic distribution is concentrated in Riyadh, in the Western Province and in the Eastern Province that are commercial hubs and where businesses tend to proliferate (UNSD, 2015). The urbanization of the population has also grown quickly over the last decades, with an average of 3,4% per year, from 50% of urbanized population in 1970 to 80% today (Anjum et al., 2016). According to the Ministry of Municipal and Rural Affairs, 88% of the latter will be concentrated in urban areas by 2025 (Al-Waket et al, n.d.).

The increasing urbanization in combination with income growth, has accelerated the diversification of diets. The consumption of meat, fish, fresh fruit and vegetables and has declined the consumption of starchy food staples. This shift towards more perishable products and shorter shelf life items might lead to increase the possibility of formation of food waste (Sergre et al., 2014).

The unemployment rate is estimated at 11%, however it only concerns men (UNSD, 2015). According to the most recent estimates, only 15% of the Saudi population still resides in rural areas, while they were 50% in 1985 (Al-Shayaa et al., 2012). The rate of urbanization is growing at 2% annually (Lovelle, 2015).

Agricultural activities' contribution to Saudi Arabia's economy

In 2013, Saudi Arabia's GDP reached $ 1.571 trillion (UNSD, 2015) and the agricultural sector represented only 6% of it (Canadian Trade Commission, 2013). On the 11,62 million work-aged people, 420,000 were employed in the agricultural sector in 2015, a number representing 3,62% of the total labor force and that has steadily been decreasing over the last 15 years (660.000 were working in the agricultural sector in 2000, 640,000 in 2005, and 520,000 in 2010), and 95.5% of the people working in the agricultural sector are men, against 4,5% of women (FAOSTAT, 2011).

Self-sufficiency

In the past, the state subsidized many programs to become self-sufficient in agricultural production to circumvent its exposure to the volatilities of food prices on international markets and decrease its dependency to food imports. Thanks to the introduction of modern agricultural technologies, the country not only become self-sufficient but also produced surplus enough to be exported, especially cereals (Al-Shayaa et al., 2012). However, the government recognized in the 1990' that this policy was not sustainable because of the high requirements in water supply management. It decided to stop to subsidy this production and rather to encourage the production of crops that are less challenging in terms of water supply and sewage treatment (Lovelle, 2015).

Even though Saudi Arabia's agricultural production is no enough to cover the food needs of its population alone, the country is food-secure thanks to large oil reserves and a strong fiscal balance that support the import of food commodities allowing to feed the population. Saudi Arabia is not only food secure at the national level, the household level is also food secure. The robust financial position of the country allows it to finance subsidy programs and to support the households to access food. Indeed, Saudi's per capita income is around US$2,000 a month, enabling the households high social spending. Currently, Saudi Arabia imports its food requirements from international sources and spends only 4% of its foreign currency on food imports. This food security is ensured if the country maintains strong exports and that food remains available on the international markets. Even during the year 2008 where food prices were substantially high, though, Saudi Arabia did not face any difficulties for securing food imports (Chatham House, 2013).

To improve its autonomy, Saudi Arabia has also outsourced its agricultural production by purchasing land in other countries that are more suited for farming, such as Sudan or Ethiopia, and repatriates the production back to Saudi Arabia (Lovelle, 2015).

Today, the food supply per capita is over 3.100 kcal/capita/per day and the food supply is composed of cereals for 45,5%, vegetable oils and animal fats for 15,2%, sugars and honey for 10,1%, meat for 7,9%, milk (excluded butter) and eggs for 5,2% and roots for 0,7% (FAOSTAT, 2011).

Main food commodities consumed are referenced in the table below.

Table 6: Top ten commodities availability for consumption in 2011

Commodity	Quantity (kcal/capita/day)
Wheat and products	758
Rice (milled equivalent)	398
Sugar (raw equivalent)	311
Maize and products	199
Palm oil	191
Poultry meat	167
Dates	149
Milk (excluding butter)	144
Sunflower seed oil	55
Maize germ oil	54

Source: FAOSTAT (2012)

Trade statistics

In 2013, Saudi Arabia was the world's 19th largest food importer, with 80% of its food needs that are imported on average (for a value of around $ 12 billion annually). The top four products that are imported account for 40% of total imports. In 2013, the country's key bilateral partners include Ukraine, Russia, India and Pakistan (Canadian Trade Commission, 2013).

Table 7: Top ten commodities import quantity in 2011

Commodity	Quantity (Tonnes)
Barley	6,351,620
Wheat	2,066,573
Maize	1,649,124
Sugar (raw centrifugal)	847,940
Chicken meat	737,263
Soybeans	613,653
Cake of soybeans	545,664
Sugar refined	398,493
Palm oil	393,343
Oranges	360,597

Source: FAOSTAT (2011)

Table 8: Top ten commodities import value in 2011

Commodity	Value (US$ 1,000)
Barley	1,958,754
Chicken meat	1,720,551
Food prep. (nes.)	1,061,303
Cigarettes	771,207
Wheat	659,339
Maize	611,379
Sugar (raw centrifugal)	597,406
Palm oil	526,473
Infant food	442,078
Milk whole dried	441,142

Source: FAOSTAT (2011)

Table 9: Top ten commodities export quantity in 2011

Commodity	Quantity (Tonnes)
Fruit juice (nes.)	397,818
Beverage (non-alc.)	289,866
Sugar refined	276,890
Cheese of whole cow milk	252,493
Waters, ice etc	225,736
Frozen potatoes	191,738
Vegetables fresh (nes.)	146,314
Pastry	122,737
Potatoes	110,266
Buttermilk, curd, acid, milk	102,945

Source: FAOSTAT (2011)

Table 10: Top ten commodities export value in 2011

Commodity	Value (US$ 1,000)
Cheese of whole cow milk	327,592
Fruit juice (nes.)	224,011
Pastry	219,498
Sugar refined	216,389
Buttermilk, curd, acid, milk	185,929
Beverage (non-alc.)	172,365
Soybean oil	112,638
Milk skim of cows	103,926
Maize oil	97,610
Macaroni	90,200

Source: FAOSTAT (2011)

1.3 Turkey

Agricultural production

Turkey is a major agricultural producer due to its climate and land nature that are suitable to produce many products. About 50.6% of the country consists of agricultural lands. In 2015, the total area of agricultural lands covered more than 239 million decare. More than half of this area (157 million decare) was made up of by arable lands (Pekcan, 2006). Agriculture has a major place in Turkish economy thanks to rich soil sources, wide biological diversity, a good climate and geographical conditions (FAO, 2013). As the food requirements of majority of the population are met by agriculture domestically, it is highly significant and influential for Turkey's economic and social development. Also, agriculture in Turkey provides the raw materials for other sectors which are dependent on agriculture (FAO, 2013).

Most of agricultural production of Turkey originates from the coastal regions (European Commission, 2013). Aegean and Mediterranean regions dominate the agricultural outputs especially in the production of vegetables and fruits due to their climatic conditions. Proximity of those two regions to prominent Turkish provinces and to export markets place them in a significant place in market oriented and intensive farms. Northern and Eastern parts, on the other hand, are significant and prominent for livestock production. It is also possible to see small scale farming and subsistence production in those regions.

The largest agricultural production value (20%) is made up of by the cereals, and the highest share within cereals belongs to wheat (70%), barley (20%) and corn (7%) respectively (FAO, 2013). Moreover, there are eight types of pulses grown in Turkey including red lentils, green lentils, chickpeas and beans. Among them, chickpeas account for the largest share of pulses with 53 percent of production, whereas the share of lentils in total pulses produce of Turkey is 28% (FAO, 2013). Beans account for 17% of all pulses grown in Turkey and they are grown in almost all parts of the country (FAO, 2013). Oilseeds too have an important place in Turkish agricultural production. It has a significant role in meeting the nutritional needs of humans and animals for their fat, protein, carbohydrate, minerals and vitamin content (FAO, 2013). Also, it is a significant

raw material for the industry. Turkey has a good potential to produce oilseeds thanks to its climatic and soil characteristics. Sunflower seeds have the highest share (70%) in the total vegetable oil consumption in Turkey (FAO, 2013). 57.8% of sunflower seeds have been produced in Thrace (FAO, 2013). After sunflower seeds, the second most produced oilseeds are sesame seeds (FAO, 2013).

Turkey has a privileged position in terms of potato production and it is possible grow potato almost everywhere in Turkey. Niğde and Nevşehir are the two leading provinces for potato culture, which together account for 28% of the production (FAO, 2013). In fact, after cereals, potato production is the second most vital for feeding the population of Turkey. Sugar beet culture, on the other hand, is practiced all over the country only except the South-eastern Anatolia region. Sugar beet production is one of the first examples of on-contract farming, which ensured the integration of farming and industry and developed food industry tremendously (FAO, 2013). While potato has the first place in production and exportation values, sugar beet is the first in terms of production quantity (FAO, 2013). It is used as raw material in the sugar industry and, its by-products are used as an additive in the pellet feed industry.

Furthermore, 51% of tobacco production of Turkey takes place in the Aegean region (European Commission, 2013). Cotton production is concentrated in South Eastern Anatolia with 45% of Turkey's production, followed by the Mediterranean with 22% and the Aegean region covering the rest. Majority of nuts is produced in the peripheries of the Black Sea regions and South Eastern Anatolia (European Commission, 2013).

Turkey is among the top 10 fresh vegetable producers in the world (FAO, 2013). The leading product is tomatoes, which is followed by green peppers and cucumbers. Mediterranean, Aegean, Marmara and Black Sea are the regions that lead the vegetable culture in Turkey. In Mediterranean region, greenhouse culture is prevalent and contributes to produce fresh vegetables. As much as those products are consumed fresh, their refined forms such as paste, juice or sun dried are preferred for consumption. Considering that vegetables are nutritionally indispensable for human beings, their production has a significant place in overall agricultural production. Other than vegetables, the various climatic conditions in Turkey allows the production of many kinds of fruits and places the country third in the world fruit production (FAO, 2013). The first three products that have the highest production value are grapes, olives and apples (FAO, 2013). Grapes and apples can be consumed fresh as well as processed, whereas olives are consumed in brine and as both table and olive oil. Apples are the most commonly processed fruit that accounts for 46 percent of the total in Turkey (FAO, 2013). Also, citrus products are produced in Turkey particularly in the Mediterranean region, in which 90% of citrus production takes place (European Commission, 2013).

Table 1: Agricultural land in years

Years	Total utilized agricultural land	Area of cereals and other crop products		Area of vegetable gardens	Area of ornamental plants	Area of fruits, beverage and spice crops	Land under permanent meadow and pastures
		Sown area	Fallow land				
2001	**40,967**	17,917	4,914	909	-	**2,610**	14,617
2002	**41,196**	17,935	5,040	930	-	**2,674**	14,617
2003	**40,644**	17,408	4,991	911	-	**2,717**	14,617
2004	**41,210**	17,962	4,956	895	-	**2,780**	14,617
2005	**41,223**	18,005	4,876	894	-	**2,831**	14,617
2006	**40,493**	17,440	4,691	850	-	**2,895**	14,617
2007	**39,504**	16,945	4,219	815	-	**2,909**	14,617
2008	**39,122**	16,460	4,259	836	-	**2,950**	14,617
2009	**38,912**	16,217	4,323	811	-	**2,943**	14,617
2010	**39,011**	16,333	4,249	802	-	**3,011**	14,617
2011	**38,231**	15,692	4,017	810	4	**3,091**	14,617
2012	**38,399**	15,463	4,286	827	5	**3,201**	14,617
2013	**38,423**	15,613	4,148	808	5	**3,232**	14,617
2014	**38,558**	15,782	4,108	804	5	**3,243**	14,617
2015	**38,551**	15,723	4,114	809	5	**3,284**	14,617

Source: TURKSTAT (2016)
Source: For land under permanent meadows and pastures 2001 General Agricultural Censuses, for other Ministry of Food, Agriculture and Livestock
Note. Figures may not be equal to total due to rounding off

Additional to all, there are also products of animal origin. Animal products such as meat, milk, eggs, honey and secondary products are indeed highly valuable and important for human nutrition and it is not possible to substitute them with any other food items. The animals whose meat contribute for the agricultural production the most are beef, chicken, sheep, goat, turkey and buffalo respectively (FAO, 2013). Although the most slaughtered animal is sheep, its production value can be ranked as third. Chicken and beef meat come before sheep in terms of production value. Also, the export value of the chicken meat is the highest among all animals. Similarly, the most important sources of milk and dairy products are goat, sheep, cows and buffalo 91.7% of the total dairy production comes from the cow's milk, 6% from the sheep's milk, 2% from goat's milk and 0.3% from buffalo milk (FAO, 2013).

Around 15% of the total agricultural production is made up of by dairy products which have a high production values. Among the most frequently consumed dairy products, there are various types of cheese, yoghurt and butter. Milk in liquid is consumed less compared to those dairy products. In the recent years, production and consumption of refined milk have increased gradually due to the industrial developments. Eggs are produced mostly in such regions as Central Anatolia, Marmara, Aegean, Mediterranean, Western Black Sea and Eastern Anatolia (FAO, 2013).

Table 2: Livestock products in years

Year	Meat (Tonnes)	Milk (Tonnes)	Chicken meat (Tonnes)	Hen eggs (1,000)	Honey (Tonnes)
2001	435,778	9,495,550	614,745	10,575,046	60,190
2002	420,595	8,408,568	696,187	11,554,910	74,554
2003	366,962	10,611,011	872,419	12,666,782	69,540
2004	447,154	10,679,406	876,774	11,055,557	7 929
2005	409,423	11,107,897	936,697	12,052,455	82,336
2006	438,530	11,952,099	917,659	11,733,572	83,842
2007	575,622	12,329,789	1,068,454	12,724,959	73,935
2008	482,458	12,243,040	1,087,682	13,190,696	81,364
2009	412,621	12,542,186	1,293,315	13,832,726	82,003
2010	780,718	13,543,674	1,444,059	11,840,396	81,115
2011	776,915	15,056,211	1,613,309	12,954,686	94,245
2012	915,844	17,401,262	1,723,919	14,910,774	89,162
2013	996,125	18,223,712	1,758,363	16,496,751	94,694
2014	1,008,272	18,630,859	894,669	17,145,389	103,525
2015	1,149,262	18,654,682	1,909,276	16,726,332	107,665

Source: TURKSTAT (2016)

Turkey is inherently advantageous in seafood production thanks to its long coastline. Seafood production, especially of fish, contributes to country's economy a lot by providing employment from production to marketing. In terms of production quantity, the top three sea products are anchovies, sprats and sardines, but their production values differ from each other (FAO, 2013). Also, it should be noted that the consumption of seafood is not much common for various reasons including socio-economic ones.

Population

The increasing urbanization of Turkey has brought about a severe decline in country's rural population. Moreover, improved economic conditions and restructuring promoted the shift of labour from agriculture to manufacturing and service sectors. Consequently, the number of people living in urban areas has become more than the number of people in rural areas since 1985 (European Commission, 2013).

In 2007, 32.5% of the total population were living in the rural parts but this percentage decreased to 22.7% in 2012 (Ministry of Food, Agriculture & Livestock, 2014). Although it was possible to see an increase in the total population by the amount of 7.1%, rural population have decreased by 8.8% (Ministry of Food, Agriculture & Livestock, 2014). This outcome proves that there is still migration from rural to urban, and it foreseen that this migration will continue in the coming years. Among the major factors driving migration, there are demographic structure, structure of employment and labour force and the opportunities to reach social and physical infrastructure services (Ministry of Food, Agriculture & Livestock, 2014).

On the other hand, looking at the wider picture, it is possible to see that the population of Turkey continuously increases. The population projections prepared by TURKSTAT by using the data of Address-Based Population Registration System (ADNKS) in 2008 indicates a population growth despite with slower rates. According to the model, the population is expected to reach around 81-83 million in 2023 (TACSS, n.d.).

Trade statistics

In general, it is possible to say that most agricultural production comes from small family farms (FAO, 2013). A small percentage of all farms is made up of by medium and large commercial farms. The farms that are larger than 5 hectares' accounts only for 57% of all farms in Turkey.

It can be said that Turkey is a net importer of wheat especially since 2007 when a severe drought happened. Also, the absence of high quality wheat requires importation of wheat from other countries (FAO, 2013). Imports of barley and corn have been decreasing since their yields have been increasing in time (FAO, 2013). Small amounts of all three cereals are exported. On the other hand, pulses are consumed domestically and their exports have decreased, whereas imports have been increasing recently (FAO, 2013).

Considering oilseeds, the produced amount has never been sufficient to meet the needs despite the increase of the output in certain years, and consequently, some amounts of oilseeds have been necessarily imported. Nevertheless, a small percent (12%) of the total production have been also exported (FAO, 2013). Similarly, the imports and exports of potato tend to fluctuate. That is, the amount imported or exported have changed from time to time. All imports of potatoes are original or mature tubers used for seeding. Moreover, besides the export of fresh vegetables, the export of dried vegetables has gradually increased in recent years. Turkey is also a net exporter in fruits. Lemon, hazelnuts, dried apricots, dried figs, peaches and apples are the leading export items of the country. In total, Turkey exported 1,781 kinds of agricultural products to 190 countries in 2015, accounting for an export volume of USD 16.8 billion (FAO, 2013).

Table3: External trade by agricultural products and economic activity

	Economic activity	Products of agriculture, forestry and fishing (US$)
Export	**Total**	**5,847,666**
	Industry	2,343,324
	Trade	3,179,775
	Other	324,568
Import	**Total**	**7,216,148**
	Industry	3,888,529
	Trade	2,990,956
	Other	336,663

Source: TURKSTAT (2016)

Self-sufficiency

According to the general discourse, the ultimate purpose of Turkey in making agricultural policies is to be self-sufficient in all agricultural products, and furthermore, to be able to export the surplus of those products (TMMOB, n.d.). However, self-sufficiency is a controversial concept which needs to be clarified.

Self-sufficiency implies the extent of meeting the domestic needs with the domestic production (Istanbul Chamber of Commerce, 2007; TURKSTAT, 2016). It should be noted that there is no country in the world that does not import agricultural products, and that is why, importing some products does not directly mean lack of self-sufficiency TURKSTAT, 2016). According to the researches, it is not possible to see a tendency towards a decline in imports but on the contrary, it is claimed that countries prefer to increase imports and exports of agricultural products in parallel so that a steadier trade volume can be achieved (Istanbul Chamber of Commerce, 2007).

Therefore, taking the domestic needs and production into consideration, it is possible to say that the agricultural production of Turkey is self-sufficient depending on the kind of the product. Considering the situation of Turkey today, it has gradually become import dependent in some of agricultural products. On the other hand, some other agricultural products are even exported to other countries.

For instance, meat is among the imported products as its production in Turkey is not sufficient for domestic consumption, nor for exportation (Acar, 2014). Also, Turkey is a net importer of certain products such as wheat and oilseeds, but that does not show their insufficiency. Unlikely, there is a boost in the export of certain products such as vegetables and fruits, dairy products and eggs (FAO, 2013). Those products are also sufficient for the domestic consumption.

According to the information shared by TURKSTAT (2016), the domestic production of cereals met the domestic need by 99% in 2013-2014 commerce year. The self-sufficiency degree of wheat was announced to be 102%, for barley as 101% and for corn as 86% for the same time. Among pulses, the highest self-sufficiency degree was reported in the same report to belong to chickpea by the percentage of 97%. Red lentil was found to be sufficient by 90%. The same data indicated that the self-sufficiency degree of potato was 101%, of sunflower seeds was 59%, and of sugar was 109%.

Table 4: The least self-sufficient agricultural products in 2014

Product	Self-sufficiency
Soybean (dry)	6.5%
Rape	21%
Green lentil	39%
Banana	53%
Rice (milled)	65%
Sunflower	73%

Source: TURKSTAT (2015)

Table 5: The most self-sufficient agricultural products in 2014

Product	Self-sufficiency
Fig	720%
Apricot	526%
Grape fruit	297%
Lemon	262%
Mandarin	235%
Nuts (total)	173%
Pomegranate	159%

Source: TURKSTAT (2016)

Agricultural activities' contribution to the Turkish economy

Agriculture is among the most important sectors in the Turkish economy in terms of employment. Its contribution to total GDP proves its significance for the country although it increasingly declined due to developments in the industry sector (European Commission, 2003). In fact, Turkey's agricultural economy was the 8th largest agricultural economy in the world in 2014. Also, agriculture has an important share in the foreign trade of the country considering that 14% of the total exports is supplied by agriculture (European Commission, 2013).

While the share of agriculture is 42,8% in gross national product (GNP) in the year when Turkey was established, it has decreased proportionally to 36% in 1970, 25% in 1980, 16% in 1990, 13,5% in 2000, 12.6%in 2003, 8.3% in 2009 and finally 7.4% in 2013 (FAO, 2013). Like the reason of decreasing population in rural areas, the sharp decrease in the share of agriculture in GNP can be explained by the developments in industrialization and service sector. Yet, agricultural production value of Turkey was about 41 billion $ in 2013 (Turkish Journal of Agricultural & Natural Sciences, 2014).

During the time-period between 2007 and 2013, a partial increase happened in the share of agricultural employment in total employment, and it reached to 24%. In 2013, the number of people employed in agricultural sector was 6 million (Ministry of Food, Agriculture and Livestock, 2014). However, looking at Table 6, it is possible to see a decline in the number of population employed in agriculture. In May, 2016, the number of people employed in the agriculture sector decreased to 5,540,000, which accounts for 20% of total employed population.

Table 6: Figures of Total Employment and Employment in Agriculture

Year	Month	Total (1,000 persons)	Agriculture (1,000 persons)	Agriculture
2016	January	26,275	4,812	18%
2016	February	26,456	4,876	18%
2016	March	26,993	5,093	19%
2016	April	27,638	5,352	19%
2016	May	27,867	5,540	20%

Source: TURKSTAT (2016)

2. DATA AND FINDINGS

2.1 Households survey

Survey participants

Table 35: Age groups by gender

Afghanistan			
Age group	**Female**	**Male**	**Total**
27-30	0%	35%	**35%**
31-40	5%	25%	**30%**
41-50	5%	25%	**30%**
51-60	0%	5%	**5%**
Total	**10%**	**90%**	**100%**
Benin			
Age group	**Female**	**Male**	**Total**
23-30	20%	0%	**20%**
31-40	30%	0%	**30%**
41-50	25%	0%	**25%**
51-60	20%	5%	**25%**
Total	**95%**	**5%**	**100%**
Cameroon			
Age group	**Female**	**Male**	**Total**
17-30	35%	11%	**46%**
31-40	26%	7%	**37%**
41-50	13%	2%	**15%**
51-60	5%	1%	**6%**
Total	**79%**	**21%**	**100%**
Saudi Arabia			
Age	**Female**	**Male**	**Total**
24-30	5%	6%	**11%**
31-40	17%	23%	**40%**
41-50	11%	26%	**37%**
51-60	6%	5%	**11%**
Total	**40%**	**60%**	**100%**
Senegal			
Age group	**Female**	**Male**	**Total**
22-30	20%	10%	**30%**
31-40	0%	20%	**20%**
41-50	20%	10%	**30%**
51-60	20%	0%	**20%**
Total	**60%**	**40%**	**100%**

Turkey			
Age groups	**Female**	**Male**	**Total**
21-30	5%	12%	**16%**
31-40	11%	6%	**18%**
41-50	12%	10%	**22%**
51-60	15%	15%	**29%**
61-70	3%	12%	**15%**
Total	**45%**	**55%**	**100%**
Uzbekistan			
Age group	**Female**	**Male**	**Total**
22-30	25%	25%	**50%**
31-40	15%	10%	**25%**
41-50	15%	0%	**15%**
51-60	5%	5%	**10%**
Total	**60%**	**40%**	**100%**

In Afghanistan, almost all the person surveyed were male (90%) while in Benin almost all the surveyed persons were women (95%). In Cameroon, 46% of the person interviewed were aged from 17 to 30. In Saudi Arabia, the respondents aged between 31 and 40 represent the biggest category (41%) while the age groups 24-30 and 51-60 represent the same percentage of respondents (11%). In Senegal, all the persons surveyed who were between 31 and 40 are men meanwhile all the all the persons surveyed in the age category 51-60 were women. In Turkey, the respondents aged between 51 and 60 were the biggest group by 30%. The respondents aged between 61 and 70 formed the smallest group by 15%. In Uzbekistan, half of the surveyed people were less than 30 years old and a quarter were aged between 31 and 41% of the people surveyed in the country were female, against 40% of male.

Table 36: Average number of members in the household

	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Afghanistan
Average number of members in the household	10	5	8	5	13	4	5

In Afghanistan, the average number of members among the surveyed households was 10, they were 5,2 in average in Benin, 8,42 in average in Cameroon, 4,6 in average in Saudi Arabia, 13,4 in average in Senegal, 3 or 4 in average in Turkey and 4 or 5 in average in Uzbekistan.

Table 37: Occupation by gender

Afghanistan			
Occupation	**Gender**		**Total**
	Female	**Male**	
Civil servant	0%	20%	**20%**
Private sector	10%	25%	**35%**
Self-employed	0%	45%	**45%**
Total	**10%**	**90%**	**100%**
Benin			
Occupation	**Gender**		**Total**
	Female	**Male**	
Housewife	60%	0%	**60%**
Private sector	20%	0%	**20%**
Retired	0%	5%	**5%**
Self-employed	15%	0%	**15%**
Total	95%	5%	**100%**
Cameroon			
Occupation	**Gender**		**Total**
	Female	**Male**	
Civil servant	11%	4%	**15%**
Housewife	12%	0%	**12%**
Private sector	23%	10%	**34%**
Retired	5%	0%	**5%**
Self-employed	26%	7%	**34%**
Total	**79%**	**21%**	**100%**
Saudi Arabia			
Occupation	**Gender**		**Total**
	Female	**Male**	
Civil servant	4%	11%	**15%**
Housewife	20%	3%	**23%**
Private sector	13%	25%	**38%**
Retired	2%	3%	**4%**
Self-employed	2%	18%	**20%**
Total	**40%**	**60%**	**100%**
Senegal			
Occupation	**Gender**		**Total**
	Female	**Male**	
Civil servant	5%	0%	5%
Housewife	25%	5%	30%
Private sector	10%	15%	25%
Retired	10%	5%	15%
Self-employed	10%	15%	25%
Total	60%	40%	100%

Turkey			
Occupation	**Gender**		**Total**
	Female	**Male**	
Civil Servant	7%	12%	**19%**
Housewife	26%	0%	**26%**
Private sector	5%	14%	**19%**
Retired	3%	19%	**22%**
Self-employed	3%	11%	**14%**
Total	**45%**	**55%**	**100%**
Uzbekistan			
Occupation	**Gender**		**Total**
	Female	**Male**	
Civil servant	0%	5%	**5%**
Housewife	40%	0%	**40%**
Private sector	10%	20%	**30%**
Retired	5%	0%	**5%**
Self-employed	5%	15%	**20%**
Total	**60%**	**40%**	**100%**

45% of the people that were surveyed in Afghanistan were self-employed, all males. Female were all working in the private sector (10%). 20% of the surveyed population was working as civil servant, all males again.

In Benin, almost 60% of the people surveyed are housewives, 20% work in the private sector and 15% a self-employed. The 5% of men are retired.

In Cameroon, almost 33,67% of the people surveyed are self-employed and the same proportion works in the private sector. Only 5,10% are retired and 15,318% are working as a civil servant. 12,24% are working as housewives and all of them are women. Almost the half of the men are working in the private sector (10,20% out of 21,43%). Regarding the latter, it should be noted that half of the women surveyed are housewives (20% out of 40%). Otherwise, most of the women surveyed are working in the private sector (13,04%).

In Saudi Arabia, almost 40% of the people surveyed are working in the private sector. Only 4% are retired, 15% are working as a civil servant, 20% are self-employed and 23% are housewives. Regarding the latter, it should be noted that half of the women surveyed are housewives (20% out of 40%). Otherwise, most of the women surveyed are working in the private sector (13%).

In Senegal, most of the people surveyed were housewife (30%, whom 25% were female), self-employed (25%) or working in the private sector (25%). Men are working mainly in the private sector or as self-employed (15% each).

Of all the respondents, 26% is housewife, 19% is civil servant and 14% is self-employed. Another 19.09% stated that they work in the private sector. The percentage of retired ones was 14%.

More than half of women participated in this research are housewives. Among the female respondents who have paid work, the biggest group contains the women that work as civil servants. On the other hand, except the housewife option, most all other occupations are consisted of males.

40% of the people that were surveyed in Uzbekistan were housewife. Housewives represent by the way two thirds of the surveyed female in Uzbekistan. Half of the surveyed male work in the private sector (20% out of 40%). Otherwise, they work mainly as self-employed (15%).

Table 38: Level of income by gender

Afghanistan			
Level of income	**Gender**		**Total**
	Female	**Male**	
High	0%	10%	**10%**
Middle	0%	30%	**30%**
Low	10%	50%	**60%**
Total	**60%**	**40%**	**100%**
Benin			
Level of income	**Gender**		**Total**
	Female	**Male**	
High	25%	0%	**25%**
Middle	30%	5%	**35%**
Low	40%	0%	**40%**
Total	**95%**	**5%**	**100%**
Cameroon			
Level of income	**Gender**		**Total**
	Female	**Male**	
High	14%	5%	**19%**
Middle	30%	6%	**36%**
Low	34%	10%	**44%**
Total	**79%**	**21%**	**100%**
Saudi Arabia			
Level of income	**Gender**		**Total**
	Female	**Male**	
High	1%	2%	**3%**
Middle	15%	37%	**52%**
Low	24%	22%	**46%**
Total	**39%**	**61%**	**100%**
Senegal			
Level of income	**Gender**		**Total**
	Female	**Male**	
High	15%	10%	**25%**
Middle	30%	10%	**40%**
Low	15%	20%	**35%**
Total	**60%**	**40%**	**100%**
Turkey			
Level of Income	**Gender**		**Total**
	Female	**Male**	
High	8%	7%	**15%**
Middle	25%	28%	**54%**
Low	12%	20%	**32%**
Total	**45%**	**55%**	**100%**

Uzbekistan			
Level of income	Gender		Total
	Female	Male	
High	15%	20%	**35%**
Middle	35%	20%	**55%**
Low	10%	0%	**10%**
Total	**60%**	**40%**	**100%**

Among the population surveyed in Afghanistan, 60% report to earn a low income. All the female report to earn a low income, by the way. They were only 10% to report earning a high income.

Among the population surveyed in Benin, a quarter state to have a high income, 35% state to earn a middle income and 40% state to earn a low income.

A minority of the people surveyed in Cameroon state to have a high income (19%) and almost the half of them state to get a low income. 36% receive a middle income from what the answered.

A little bit more than half of the people surveyed in Saudi Arabia (52%) stated they have a middle level of income and only 3% stated that their level of income is high.

Among the population surveyed in Senegal, a quarter state to have a high income, 40% state to earn a middle income and 35% state to earn a low income.

In Turkey, more than half of the respondents (53%) stated that their level of income is middle.

Among the population surveyed in Uzbekistan, 55% earn a middle income according to what they reported. While half of the male (20%) stated that they earn a high income, only a quarter of the female (15%) reported to earn a high income. They were, though, 35% to state that they earn a high income. The only ones who reported to earn a low income ere female (10%).

Survey participants' food habits

Table 39: Person who routinely purchases food

Person doing food shopping	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Father	60%	5%	11%	62%	0%	49%	65%
Children	35%	10%	6%	1%	20%	2%	5%
Mother	0%	85%	77%	0%	60%	34%	25%
House assistant	0%	0%	1%	0%	15%	0%	0%
Parents	0%	0%	4%	0%	0%	15%	0%
Others	5%	0%	1%	37%	0%	0%	5%

In most of the cases (60%), it is the father that purchases the food in Afghanistan, among the population surveyed. In 35% of the cases, foodstuffs are purchased by the children. In Benin, it is the mother that purchases the food, followed by the children, among the population surveyed. In Cameroon, it is also the mother that purchases the food, otherwise it is the father in 11% of the cases. In Saudi Arabia, it is mainly the fathers that purchases the food (62%). It is mainly the mother in Senegal, followed by the children. It is the father (50%) that purchases the food in most of the cases in Turkey, followed by the mother (35%). And in Uzbekistan, it is also the father that purchases the food in 65% of the cases.

Table 40: Person who does supplementary food shopping

Person doing supplementary food shopping	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Father	35%	0%	15%	57%	0%	30%	60%
Children	40%	45%	11%	2%	25%	15%	5%
Mother	15%	35%	66%	25%	50%	47%	30%
Janitor	0%	0%	0%	0%	0%	1%	0%
House assistant	0%	20%	4%	2%	25%	0%	0%
Parents	5%	0%	3%	14%	0%	7%	0%
Others	5%	0%	1%	1%	0%	14%	5%

In Afghanistan, additional food shopping nearly is mainly done by the children in 40% of the cases surveyed, followed by the father in 35% of the cases. In Benin, children usually purchase supplementary food shopping (45%). If not, it is the mother that takes care of it (35%), and then the house assistant (20%). In Cameroon, it is the mother that usually purchases supplementary food shopping (66%). If not, it is the mother that takes care of it (15%), or the children, then (11%). In Saudi Arabia, it is the father that usually purchases supplementary food shopping (57%). If not, it is the mother that takes care of it (25%), and then the parents (14%). In half of the surveyed cases, it is the mother that does the supplementary food shopping in Senegal. If not, the children or the house assistant take care of it in half of the cases (25% each). In Turkey, supplementary food shopping is made usually by mother (47%) in the household, and then by father (30%). In Uzbekistan, additional food shopping nearly follows the same pattern as main food shopping, with the father doing them in 60% of the cases surveyed and the mother in 30%.

Table 41:. Frequency of food shopping

Frequency of food shopping	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Always	11%	16%	38%	18%	35%	39%	50%
Often	26%	53%	35%	46%	20%	51%	40%
Sometimes	16%	32%	19%	33%	15%	10%	5%
Rarely	37%	0%	5%	4%	30%	0%	5%
Never	11%	0%	3%	0%	0%	0%	0%

Afghanistan respondents are quite divided as for the frequency of doing food shopping. Indeed, most respondents (53%) do the food shopping at least *sometimes*. However, there is also many respondents that do their food shopping at the most *sometimes* (63%).

All the people surveyed in Benin and that answered the question stated that they go to purchase food at least *sometimes*. A little bit more than the half of them reported to go often.

A broad majority of the people surveyed in Cameroon (73%) stated that they *always* or *often* go to purchase food 19% do it *sometimes*.

46% of the people surveyed in Saudi Arabia stated that they *often* go to purchase food whereas 18% reported to *always* do food shopping and 32% do it *sometimes*.

In Senegal, 70% of the people surveyed reported to do the food purchases at least *sometimes*.

In Turkey, more than half of all respondents (51%) stated that they often do food shopping. 39% of them reported to do always, whereas only 10% gave the answer "sometimes".

In Uzbekistan, almost all the surveyed people reported to do the food purchases at least *often*.

Table 42: Place of the main food shopping

Place of the main food shopping	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Bazaar	55%	60%	2%	1%	20%	16%	60%
Supermarket	20%	20%	23%	97%	25%	84%	40%
Street sellers	25%	5%	39%	0%	55%	0%	0%
Bio-products shops	0%	15%	35%	2%	0%	0%	0%

Afghanistan people prefer to do their food shopping at the bazaar (55%). Most of the Beninese surveyed do their food at the bazaar (60%). Otherwise it is at the supermarket or with street sellers. Approximately the same proportion of people surveyed in Cameroon do their food shopping among street sellers (35%) or to bio products market places (39%). Only 23% of them do their food shopping in supermarket. In Saudi Arabia, almost everybody stated they do their food shopping in supermarkets (97%). Street sellers are the places were 55% of Senegalese people go to purchase their foodstuffs. In Turkey, a clear majority of the respondents (84%) stated that they do main food shopping from the supermarket and only 15% from Bazaar. Uzbekistan people prefer to do their food shopping at the bazaar (60%) or the supermarket (40%) rather than among street sellers or to bio-products shops.

Table 43: Frequency of checking the food at home before main food shopping (percentage)

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Always	15%	65%	68%	27%	40%	50%	65%
Often	25%	35%	16%	52%	10%	34%	10%
Sometimes	20%	0%	9%	19%	15%	15%	10%
Rarely	15%	0%	4%	2%	25%	1%	5%
Never	25%	0%	2%	0%	10%	1%	10%

The participants to the survey are also divided as for the frequency of checking the food at home before main food shopping in Afghanistan. The same percentage of those who check at least *often* (40%) is the same as of those who check at the most *rarely* (40%).

In Benin, everybody checks the remaining food at home before going to do their food shopping at least *often*.

A very strong majority of the people interviewed in Cameroon stated that they check the remaining food at home before going to do their food shopping at least *often* (85%). Only 6% *rarely* or *never* check before shopping.

In Saudi Arabia, just over the half of the respondents stated that they *often* check the food at home before they go to do their main food shopping. 27% stated they always do it, while 19% sometimes do it.

In Senegal, many the respondents stated that they check the food at home before going to purchase the food at least *sometimes* (65%). However, a quarter of them *rarely* do so and 10% *never* check.

In Turkey, almost half of all respondents (50%) reported that they always check the food at home before they go to main food shopping and 34% said they often do it. Some 27% check food items available at home before going the shopping from time to time.

In Uzbekistan, most the respondents stated that they *always* check the food at home before going to purchase some (65%). Only 5% of them *rarely* do it and 10% *never* check.

Table 44: Frequency of planning the meals for the days ahead

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Always	0%	20%	30%	19%	25%	23%	25%
Often	5%	25%	33%	51%	10%	50%	10%
Sometimes	10%	30%	18%	22%	15%	20%	20%
Rarely	50%	25%	18%	8%	20%	6%	15%
Never	35%	0%	0%	0%	30%	1%	30%

Clear majority of Afghanistan respondents rarely or never plan the meals for the days ahead (85%).

A clear majority of the respondents (75% of the cases surveyed) plan their meals for the days ahead in Benin.

Usually (in 64% of the cases surveyed), the respondents plan their meals for the days ahead in Cameroon.

Usually, the respondents plan their meals for the days ahead in Saudi Arabia. Only 8% of them rarely do it.

In Senegal, half of the respondents *rarely* (20%) or *never* (30%) plan the meals for the days ahead. 25% do it *always*, 10% *often* and 15% *sometimes*. A clear majority of the respondents (75% of the cases surveyed) plan their meals for the days ahead in Senegal.

In Turkey, nearly half of the respondents often plan their meals for the days ahead. Overall, around 62% of the households plans the meals ahead and the rest (38%) do not.

Uzbekistan respondents don't especially plan the meals for the days ahead. They are quite shared about the frequency of planning the meals. They are 35% to plan at least *often* but 45% to do so at the most *rarely.*

Table 45: Frequency of making a list of food items before going to food shopping

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Always	0%	45%	44%	23%	26%	28%	47%
Often	35%	25%	20%	26%	53%	31%	21%
Sometimes	10%	0%	24%	43%	16%	31%	10%
Rarely	40%	10%	8%	79%	21%	27%	53%
Never	15%	20%	3%	0%	32%	64%	16%

Most the Afghanistan participants *rarely* (40%) or *never* (15%) make a list of the food items they are going to purchase. 35% *often* make a list but nobody *always* does it.

Beninese respondents also usually make a list of the food items they are going to purchase (70% of them do it at least *often*).

Cameroonian respondents also usually make a list of the food items they are going to purchase (65% of them do it at least *often*). Only 11% of them *rarely* or *never* do it.

Saudi respondents also usually make a list of the food items they are going to purchase. Only 8% of them rarely do it.

A short majority of the Senegalese participants that answered to this question *rarely* (32%) or *never* (21%) make a list of the food items they are going to purchase. A little bit more than a quarter of them always do so, however.

Overall, almost 59% of the Turkish respondents usually make a list before going to shopping. However, the rest does not regularly prepare a shopping list.

In Uzbekistan, a strong majority of the participants that answered to this question *always* (47%) or *often* (21%) make a list of the food items they are going to purchase. A little bit more than a fifth of them *rarely* (5%) or *never* (16%) do so.

Table 46: Frequency of sticking to buying the items on the list

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Always	5%	35%	23%	11%	10%	35%	40%
Often	15%	35%	34%	22%	20%	46%	20%
Sometimes	45%	5%	27%	52%	30%	14%	15%
Rarely	15%	5%	11%	14%	25%	4%	10%
Never	20%	20%	4%	1%	15%	1%	15%

There is 45% of the surveyed Afghanistan that *sometimes* stick to buying the items they planned to buy with their shopping list. Many the others *rarely* or *never* do it while they are 15% to *often* stick to buying the items they planned to buy with their shopping list and 5% to *always* do it.

In Benin, most of the respondents report that they *often*, or more frequently, stick to buying just the items on their list that they prepared before going to food shopping (75%). 20% *never* do so.

In Cameroon, most of the respondents report that they *sometimes*, or more frequently, stick to buying just the items on their list that they prepared before going to food shopping. Only around 15,15% of them *rarely* or *never* stick to their shopping list.

In Saudi Arabia, most of the respondents report that they *sometimes*, or more frequently, stick to buying just the items on their list that they prepared before going to food shopping. Only around 16% of them *rarely* or *never* stick to their shopping list.

Senegalese respondents are quite divided as for sticking to buying the items the planned to buy with their shopping list. 30% reported to do so *sometimes*, 25% *rarely* and 20% *often*. They are 15% to *never* stick to their shopping list and 10% to *always* stick to it.

This table indicates that nearly half of the surveyed Turkish participants (46%) often stick to buying just the items on their list that they prepared before going to food shopping. On the contrary, small percentages of them said that they never (1%) or rarely (4%) stick to their shopping lists.

Most of the Uzbekistan respondents stick to buying the items they planned to buy with their shopping list. 60% report to do it *often* or more and 75% at least *sometimes*.

Table 47: Frequency of purchasing food items that the respondents were not anticipated to buy

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Always	5%	0%	12%	5%	0%	1%	45%
Often	5%	30%	20%	13%	25%	12%	20%
Sometimes	30%	40%	44%	33%	20%	42%	35%
Rarely	45%	30%	19%	47%	35%	36%	0%
Never	15%	0%	5%	1%	20%	9%	0%

Many the Afghanistan respondents *rarely* (45%) or *never* (15%) purchase food items that they were not anticipated to buy at least *sometimes* (100%).

People in Benin are quite divided as for the frequency to buy food items that they were not anticipated to. 30% stated to *often* do so, 40% *sometimes* do so and 30% *rarely* do so.

The clear majority of people surveyed in Cameroon (66%) stated that they purchase food items that they were not anticipated to buy at least *sometimes*. Almost a quarter of them (24%) *rarely* or *never* do so.

The clear majority of people surveyed in Saudi Arabia stated that they rarely (in 47% of the cases) or sometimes (33% of the cases) purchase food items that they were not anticipated to buy.

People in Senegal are quite divided as for the frequency to buy food items that they were not anticipated to. 35% stated to *rarely* do so, 25% *sometimes* do so and 20% stated or to *sometimes* or to *never* buy food items that they were not anticipated to buy.

In Turkey, 42% stated that they sometimes purchase food items that they were not anticipated to buy. 36% of them said they rarely buy those items. However, only 1% of respondents reported that they always buy food items that are not in their lists.

All the Uzbekistan people purchase food items that they were not anticipated to buy at least *sometimes* (100%).

Table 48: Frequency of ordering takeaways or eating at restaurants instead of cooking a meal indoors

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Always	0%	0%	8%	4%	0%	1%	5%
Often	0%	0%	12%	11%	26%	5%	10%
Sometimes	15%	20%	20%	33%	21%	26%	30%
Rarely	35%	60%	35%	50%	21%	35%	30%
Never	50%	20%	25%	3%	32%	33%	25%

The clear majority of the respondents in Afghanistan *rarely* (35%) or *never* (50%) order takeaways or go eating to the restaurant. They were only 15% to report to *sometimes* go order some food or go to the restaurant and nobody report to do it *often* or *always*.

Most of the Beninese respondents *rarely* (60%) order takeaways or go eating at restaurants instead of cooking at home. 20% *sometimes* do so but none of them reported to *often* or *always* order takeaways or go eating at restaurants.

Cameroonian interviewed are not so used to order takeaways or to go eating at restaurants instead of cooking at home. 50% *rarely* or *never* do so and 70% do so *sometimes* or less frequently.

Half of the Saudi respondents rarely order some food or go to the restaurant instead of cooking a meal at home. They are only 3% to state that they never go to the restaurant or never order something instead of cooking at home. 32% state that they sometimes go to the restaurant or order something from outside.

In Senegal, 74% of the respondents' order takeaways or go eating at restaurants instead of cooking at home *sometimes* at the most.

It can be comprehended from this table that a very small percent of all the Turkish respondents (1%) always and 5% of them often order takeaways or eat at restaurants instead of cooking a meal at indoors. 35% stated that they rarely order takeaways or eat at restaurants, and 32% said that they never eat from outside.

Most of the people surveyed in Uzbekistan do not order takeaways or go eating to the restaurant very often. 85% of them do it *sometimes* at the most.

Table 49: Frequency of cooking from scratch

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Always	0%	0%	26%	22%	0%	58%	65%
Often	60%	30%	21%	39%	25%	35%	5%
Sometimes	40%	45%	21%	32%	25%	4%	20%
Rarely	0%	25%	21%	6%	35%	1%	5%
Never	0%	0%	6%	1%	15%	3%	5%

Many the Afghanistan respondents *often* cook from scratch (60%). All of them report to do it at least *sometimes.*

30% of the Beninese respondents *often* cook from scratch at home, while 45% *sometimes* do so. 25% *rarely* cook from scratch.

Cameroonian people are quite divided as for answering the question of the frequency of cooking from scratch. 6,19% never do so but for the rest, the breakdown of the answers is regular with a fifth or a quarter of the surveyed persons for each proposition.

As for the Saudi respondents, almost all of them reported that they cook some dishes from scratch whereas around 7% rarely or never cook anything from scratch.

Senegalese respondents rarely (35%) or *never* (15%) cook from scratch at home. The other half do it at least *sometimes*. So, the respondents are quite divided in their habits in this regards but the majority do it only *sometimes,* at the most (75%).

More than half of all Turkish participants (58%) stated that they always cook a food from scratch, whereas only 1% said rarely and 3% said never to the question asking about the frequency of cooking a food from scratch.

Uzbekistan respondents cook from scratch at least *sometimes* (90% of the cases). They are only 10% do *rarely* (5%) or *never* (5%) cook from scratch.

Table 50: Frequency of heating up chilled or frozen meals or eating convenience foods

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Always	0	70	33	5	0	0	5
Often	0	30	20	27	25	4	5
Sometimes	5	0	21	54	25	25	20
Rarely	55	0	20	13	30	37	20
Never	40	0	5	1	20	35	50

Almost all the participants to the survey lead in Afghanistan reported that they never (40%), or at the most rarely (55%) eat ready-to-eat food or reheat chilled or frozen meal.

All the Beninese respondents reported to eat ready-to-eat food or reheat chilled or frozen meal at least *often*.

Cameroonian respondents are fairly divided on the answer to this question, with a fifth of them answering *rarely*, *sometimes* or *often* to the question of the frequency of eating reheated chilled or frozen meals or eating convenience foods. On third of them always do it.

Half of the Saudi respondents stated that they *sometimes* heat chilled or frozen meals and eat convenience food. 27% *often* eat convenience food and 13% *rarely* do it.

75% of the respondents to the survey lead in Senegal reported to eat ready-to-eat food or reheat chilled or frozen meal at the most *sometimes*.

Looking at this table, it is possible to see that nobody among Turkish respondents stated that they always heat up chilled or frozen meals or eat convenience foods. Overall, clear majority of the respondents do not prefer frozen or convenience foods.

A strong majority of the participants to the survey lead in Uzbekistan reported that they never (50%), or at the most rarely (20%) eat ready-to-eat food or reheat chilled or frozen meal. 20% *sometimes* do it and 5% *often* or *always* do it.

Table 51: Number of days in a regular week to cook more than one meal

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Five and more days	25	20	10	3	5	27	20
Four days	10	25	12	6	0	25	5
Three days	15	35	26	11	26	24	20
Two days	25	15	28	50	26	14	15
One day	25	5	24	29	42	10	40

25% of the surveyed population in Afghanistan reported to cook more than one meal one day, *two days* or *five days* in the week *or more*. 15% reported to do it three days in the week, and 10% four days in the week

A quarter of the Beninese respondents stated that they cook more than one meal five days or more in a week. 60% also do so three (35%) or four days (25%) in the week.

Around a quarter of the Cameroonian respondents stated that they cook more than one meal once (24%), or twice (28%) or three times (27%) a week to meet the wishes of different members of their households. They are 12% to do so four days per week and 10% to do it at least five time per week.

Half of the people surveyed in Saudi Arabia stated that stated that they cook more than one meal twice a week to meet the wishes of different members of their households. They are 29% to do so once per week and 3% to do it at least five time per week.

Almost none of the Senegalese interviewees reported to cook more than one meal in a day. 42% cook more than one meal one day in the week and 26% do so or two days or three days in the week.

As the data indicates, all Turkish participants cook more than one meal at least once a week to meet the wishes of different members of their households. 27% of them stated that they cook more than one meal almost every day.

40% of the surveyed population in Uzbekistan reported to cook more than one meal one day in the week, 15% two days in the week, 20% said that they do it three days in the week, 5% four days and they were 20% to state that they do so five times or more.

Disposal of un-eaten food

Table 52: Key causes to get rid of the food that is uneaten

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Health reasons	26%	44%	39%	31%	48%	23%	56%
To avoid food poisoning	19%	42%	23%	34%	10%	33%	28%
To keep the fridge clean	2%	9%	8%	20%	38%	9%	8%
I prefer fresh daily cooked food	28%	2%	12%	8%	5%	21%	8%
Old food does not taste well	25%	2%	19%	7%	0%	14%	0%

When Afghanistan respondents were asked about the key causes to get rid of the food that is not eaten, the most frequently mentioned reason was "I prefer fresh daily cooked food" (28%), followed by *Health reasons* (26%) and then *Old food does not taste well* (25%).

When Beninese respondents were asked about the key causes to get rid of the food that is not eaten, the most frequently mentioned reason was *health reasons* (44%), followed by *to avoid food poisoning* (42%) and *to keep the fridge clean* (9%).

When Cameroonian respondents were asked about the key causes to get rid of the food that is not eaten, the most frequently mentioned reason was *health reasons* (39%), followed by *to avoid food poisoning* (23%) and *old food does not taste well* (19%).

When Saudi participants are asked to list the three key causes for them to get rid of the food that is not eaten, the first reason that was most frequently given was "to avoid food poisoning" (for 34% of the respondents), then for health reasons (for 31% of the respondents) and thirdly to keep the fridge clean (for 20% of the respondents).

When Senegalese respondents were asked about the key causes to get rid of the food that is not eaten, the most frequently mentioned reason was *health reasons* (48%), followed by *to fridge clean* (38%).

When Turkish participants are asked to list the three key causes for them to get rid of the food that is not eaten, the most frequently given answer was "to avoid food poisoning" by 33% of the cases, followed by health reasons (23%) and "I prefer fresh daily cooked food" (21%).

When Uzbekistan respondents were asked about the key causes to get rid of the food that is not eaten, the most frequently mentioned reason was *health reasons* (56%), followed by *food poisoning* (28%) and then *to keep the fridge clean* and *I prefer fresh daily cooked food* (8% each).

Table 53: The ways of disposing the food that is not eaten

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Nearest Bin	65%	60%	61%	29%	87%	53%	25%
Special food waste collector	5%	0%	6%	16%	0%	77%	5%
Give it to animals	10%	35%	22%	23%	12%	22%	55%
Give it to charities	0%	0%	6%	6%	0%	48%	10%
Give it to poor people	20%	5%	8%	25%	1%	0%	5%
Dump it to produce compass	65%	60%	61%	29%	87%	53%	25%

In Afghanistan, most people that were interviewed reported to dispose the food that is not eaten to the nearest bin. Otherwise, 20% give to poor people and 10% to animals.

Most of the respondents to the survey lead in Benin dispose the uneaten food in the nearest bin (60%). Most of the other reported to give it to animals (35%).

A strong majority of the respondents dispose the uneaten food in the nearest bin in Cameroon. Otherwise, 22% give it to animal. The rest of the respondents are divided in the ways they dispose the uneaten food.

In Saudi Arabia, 29% of the people dispose the food that is not eaten into the nearest bin, 25% of them give it to poor people, 23% give it to animals and 16% of them collect it in special food waste collector.

Most of the respondents to the survey lead in Senegal dispose the uneaten food by giving it to animals. Most of the others reported to give it to poor people (25%).

Of all the Turkish participants, majority (87%) informed that they dispose the food that is not eaten by throwing into the nearest bin. 12% reported that they give it to animals and only 1% give it to poor people.

Most the respondents to the survey lead in Uzbekistan dispose the uneaten food by giving it to animals (55%). 25% dispose it to the nearest bin and 10% give it to charities. 5% give to poor people or dispose it to a special food waste collector.

Table 54: The ways of disposing food waste like tea bags, coffee granules and vegetable peelings

Ways of disposal	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Throw them to normal bin	100%	100%	85%	97%	10%	98%	90%
Special Recycling Center	0%	0%	7%	1%	65%	1%	5%
Dump them to produce compass	0%	0%	5%	2%	0%	1%	5%
Throw them to septic system	0%	0%	3%	0%	25%	0%	0%

In Afghanistan, all the respondents dispose the items to a normal bin (100%). In Benin, all the respondents throw the afore mentioned items in normal bin. In Cameroon, the clear majority (84,54) of the respondents throws the items in normal bin. Almost everybody in Saudi Arabia throws the afore mentioned items in normal bin.

In Senegal, 65% of the respondents dispose the items to special recycling centers, 25% throw them to septic system and 10% throw them to normal bin.

Almost all the Turkish participants (98%) throw the food waste like tea bags, coffee granules and vegetable peelings to a normal bin. Only small percentages stated to take them to special recycling center (1%) or to dump them to produce compass (1%).

In Uzbekistan, too almost all the respondents dispose the items to a normal bin (90%). The other dump them to produce compass or dispose them to a special recycling center (5% each).

Table 55: Ways of disposing spoilt milk and other liquids (percentage)

Ways of disposal	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Dispose them to toilet	0%	0%	38%	3%	0%	2%	0%
Dispose them to washbasin	60%	30%	22%	75%	0%	10%	5%
Dispose them to outside (garden. river. lake etc.)	40%	70%	29%	3%	5%	75%	0%
Make cottage cheese	0%	0%	2%	1%	15%	8%	47%
Take them to collection sites	0%	0%	9%	18%	80%	5%	47%

Most of the people dispose their spoilt milk and other liquids to the washbasin in Afghanistan. All the others dispose them outside.

The most common way of disposing spoilt milk and other liquids according to the participants to the survey in Benin is to dispose them outside (70%) or to the washbasin (30%).

The most way of disposing spoilt milk and other liquids in Cameroon is to dispose them to toilets for 38% of the respondents. 29% Dispose them to outside and 22% dispose them to washbasin.

Many the Saudi participants stated that they dispose spoilt milk and other liquids to washbasin (75%). The other quite frequent stated behavior is to bring them to collection site (18%).

The most common way of disposing spoilt milk and other liquids according to the participants to the survey in Senegal is to dispose them to collection sites (for 80% of the surveyed cases).

Most the Turkish participants stated that they dispose spoilt milk and other liquids to washbasin (75%). 10% reported to dispose them to toilet and 2% dispose them outside. On the other hand, a small percentage of the respondents take them to collection sites (5%) or make cottage cheese (8%).

The most common way of disposing spoilt milk and other liquids according to the participants to the survey in Uzbekistan is to dispose them to collection sites or to make cottage cheese (each proposition receiving 47% of the responses in this country).

Table 56: Categories of food that the respondents overbuy and dispose

Categories of food	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Bakery products	35%	0%	25%	0%	0%	26%	0%
Dairy products	12%	0%	7%	15%	15%	18%	6%
Fruit & Vegetables	47%	95%	54%	25%	25%	49%	76%
Sweets	0%	0%	0%	0%	0%	0%	0%
Meat/Fish/ Chicken Products	6%	5%	9%	60%	60%	3%	6%
Others	0%	0%	4%	0%	0%	4%	12%

35% of the Afghanistan people that were surveyed stated that *bakery products* are the category of food that they overbuy and dispose the most. 47% reported to overbuy and dispose *fruits and vegetables* the most and 12% reported to overbuy and dispose *dairy products* the most.

Food and vegetables is the category of food that Beninese respondents answered to overbuy and dispose the most (for 95% of them).

Food and vegetables is the category of food that Cameroonian respondents answered to overbuy and dispose the most (54%), followed by *Bakery products* (25%).

67% of the surveyed persons in Saudi Arabia reported that the products they overbuy and then end up throwing them out are bakeries, followed by dairy products (14%) and then fruits and vegetables (13%).

Meat/fish/chicken products is the category of food that Senegalese respondents answered to overbuy and dispose the most (for 60% of them), followed by *fruits and vegetables* (25%) and *dairy products* (15%).

49% of the Turkish people that were surveyed reported that they overbuy fruits and vegetables, and end up throwing out. This was the most frequently given answer. Other than fruit and vegetables, bakery products (26%) and dairy products (18%) are overbought and thrown out.

Fruits and vegetables is the category of food that Uzbekistan respondents answered to overbuy and dispose the most (for 76% of them), followed by *others* (12%).

Table 57: Frequency of disposing spoilt milk and other liquids per week

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Never	45%	25%	32%	13%	50%	13%	25%
Rarely	35%	55%	56%	30%	20%	66%	40%
Once a week	15%	20%	6%	50%	25%	19%	25%
Twice a week	5%	0%	3%	4%	5%	2%	10%
More than twice a week	0%	0%	3%	0%	0%	3%	0%

Most the Afghanistan respondents stated that they *rarely* (35%) or *never* (45%) dispose spoilt milk and other liquids.

The clear majority of the Beninese respondents stated that they *rarely* (55%) or *never* (20%) dispose spoilt milk and other liquids. The remaining respondents dispose spoilt milk and another liquid maximum once a week.

The clear majority of the Cameroonian respondents stated that they *rarely* (56%) or *never* (32%) dispose spoilt milk and other liquids.

13% of the respondents in Saudi Arabia *never* dispose spoilt milk or *rarely* (30%). Half of them say that they do so maximum once a week (50%) in general.

The clear majority of the Senegalese respondents stated that they *rarely* (20%) or *never* (50%) dispose spoilt milk and other liquids. The clear majority of the remaining respondents (25%) dispose spoilt milk and other liquids once a week.

66% of the Turkish attendants to the survey stated that they dispose spoilt milk and other liquids rarely. 19.09% once a week dispose them whereas 13% never do that.

Most the Uzbekistan respondents stated that they *rarely* (40%) or *never* (25%) dispose spoilt milk and other liquids. 25% dispose these once a week and 10% twice a week.

Table 58: Common reasons for throwing out the food

Reasons	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Over purchasing	50%	0%	16%	36%	0%	5%	11%
Over stocking	5%	5%	3%	11%	30%	3%	16%
Not willing to consume leftover food	25%	5%	13%	6%	5%	14%	11%
Prefer to consume fresh food	0%	0%	0%	3%	0%	0%	0%
Expiration date	5%	30%	46%	40%	10%	41%	53%
Space problem to keep	0%	0%	2%	3%	50%	5%	0%
Freshness - consciousness	0%	0%	17%	0%	5%	31%	0%
Others	15%	60%	2%	0%	0%	3%	0%

This table indicates that over purchasing is the most common reason for throwing out the food is related to the expiration date for a half of the Afghanistan respondents. A quarter of them answered that the most common reason is that they don't want to consume leftover food.

It also indicates that 30% of the Beninese respondents answered that the most common reason for throwing out the food is the expiration date. 60% of the respondents mentioned another reason. These latter mentioned *a problem with the taste* of the food.

It further highlights that the most common reason for throwing out the food is the expiration date by 46% of the Cameroonian, and it is followed by over purchasing by the freshness consciousness (17%). 16% state that it is because of over purchasing, whereas the rest mentioned that they don't want to consume leftover food, that they throw out the food because of a lack of space to keep it or because of over stocking.

In Saudi Arabia, the most common reason for throwing out the food is the expiration date by 40.00%, and it is followed by over purchasing by 36%. 11% state that it is because of over stocking, whereas the rest mentioned that they don't want to consume leftover food, that they prefer to consume fresh food or that they throw out the food because of a lack of space to keep it.

In Senegal, half of the respondents answered that the most common reason for throwing out the food is the lack of space to keep it (50%). 30% of the respondents mentioned over stocking as the most common reason to throw out the food.

In Turkey, the most common reason for throwing out the food is the expiration date by 41%, and it is followed by freshness-consciousness by 31%. 14% of respondents are not willing to consume the leftover food, whereas the rest mentioned over purchasing, over stocking, space problem to keep and spoilt food as the common reasons to throw out the food.

In Uzbekistan, a little bit more than a half of the respondents who answered this question report that the most common reason for throwing out the food is related to the expiration date (53%).

Over stocking was mentioned by 16% of the surveyed cases, and over purchasing as well as not willing to consume leftover food by 11% each.

Table 59: The extent that throwing out food bothers

Extent	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
A great deal	0%	90%	44%	32%	55%	47%	25%
A fair amount	0%	10%	14%	26%	0%	35%	30%
A little	10%	0%	31%	26%	5%	16%	15%
Not very much	25%	0%	6%	16%	35%	2%	15%
Not at all	65%	0%	5%	0%	5%	0%	15%

According to the survey lead in Afghanistan, there is 65% of the respondents that are *not* bother *at all* by throwing food away. Afghanistan people are *a little* bothered by throwing food away, at the most. Indeed, nobody reported to be bothered *in a fair amount* or *in a great deal*.

All the Beninese surveyed reported to be bothered by throwing food away at least in *a fair amount*. Few respondents are not very much bothered (6%) or not bothered at all (5%) about throwing out food in Cameroon. Most of them are bothered about it in a great deal (44%), in a fair amount (14%) or at least a little bit (31%).

Few respondents are not very much bothered (6%) or not bothered at all (5%) about throwing out food in Cameroon. Most of them are bothered about it in a great deal (44%), in a fair amount (14%) or at least a little bit (31%).

Few respondents are not very much bothered or not bothered at all about throwing out food in Saudi Arabia (16%). Most of them are bothered about it in a great deal (32%), in a fair amount (26%) or at least a little bit (26%).

55% of the Senegalese reported to be bothered *in a great deal*. However, 35% of the respondents reported not to be bothered very much, which constitutes a strong minority of the respondents.

Almost half of the Turkish respondents (47%) stated that they are very much bothered of throwing out food and 35% are bothered a fair amount. In contrast, around 18% of them do not worry much.

55% of the Uzbekistan reported to be bothered *in a great deal* or *in a fair amount*. The rest of the respondents were divided between *a little*, *not very* much and *not at all* (15% each).

Table 60: Frequency of reading articles, watching TV programs or relevant media programs on food waste

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Always	0%	0%	12%	4%	15%	3%	25%
Often	0%	15%	15%	26%	25%	2%	15%
Sometimes	0%	0%	19%	41%	50%	23%	35%
Rarely	0%	35%	23%	19%	10%	37%	15%
Never	100%	50%	31%	12%	0%	35%	10%

Afghanistan participants reported that they *never* read articles, watch TV programs or relevant medias on waste.

Most of the respondents in Benin *rarely* (35%) or *never* (50%) watch TV programs or relevant media programs on food waste.

A little bit more than a half of the respondents to the survey lead in Cameroon reported that they *rarely* (23%) or *never* (31%) watch TV programs or relevant media programs on food waste. 19% do so *sometimes*, 15% *often* and 12 *always*. So, the responses are slightly divided between the respondents.

Most respondents surveyed in Saudi Arabia stated that they *sometimes* (26%) or *often* (41%) read articles, watch TV programs or relevant media programs on food waste. A substantial share of them *rarely* (19%) or *never* (12%) do so and 4% stated that they always read articles, watch TV programs or relevant media programs on food waste.

Most of the respondents in Senegal watch TV programs or relevant media programs on food waste at least *sometimes* (90%).

As it can be seen from this table, the majority people who are surveyed rarely (37%) or never (35%) read articles, watch TV programs or relevant media programs on food waste. While some of them sometimes do (23%), the rest said they often (2%) or always (3%) reads or watches on food waste.

Uzbekistan participants are divided as for the answers to the frequency of reading articles, watching TV programs or relevant medias on food waste. 25% that they *always* do so, 15% *often* or *rarely* do so while 35% *sometimes* do it.

Table 61: Frequency of finishing the plate when they eat at home

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Always	5%	60%	37%	19%	5%	69%	50%
Often	40%	40%	26%	41%	20%	26%	20%
Sometimes	45%	21%	21%	38%	35%	3%	5%
Rarely	10%	11%	11%	3%	20%	1%	20%
Never	0%	5%	5%	0%	20%	1%	10%

90% of the Afghanistan respondents reported to finish their plate when they eat at home at least *sometimes.* They are only 10% to *rarely* finish it.

All the respondents in Benin reported to finish their plate *always* (60%) or at least *often* (40%) when they eat at home.

Many Cameroonian respondents reported to finish their plate *always* (37%) or *often* (26%) when they eat at home. 20,62% reported to finish it *sometimes* whereas they are only 11% to *rarely* finish their plate at home.

In Saudi Arabia, none of the respondents stated that they never finish their plate when they eat at home. The clear majority of them stated that they *often* (41%) or *sometimes* (38%) finish their plates when they eat at home, if not *always* (19%).

Senegalese respondents are very divided as for the frequency of finishing the plate when they eat at home. Aggregated results show that 60% finish it at least *sometimes.*

Clear majority of the Turkish respondents always (69%) or often (26%) finish their plates when they eat at home.

Uzbekistan respondents *often* or *always* finish their plate when they eat at home in 70% of the cases surveyed. 20% *rarely* do it and 10% *never* finish their plate at home.

Table 62: Frequency of opening a new package of food when there is already an open one

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Always	0%	0%	11%	2%	10%	2%	17%
Often	5%	10%	12%	2%	10%	2%	17%
Sometimes	10%	15%	19%	20%	20%	20%	28%
Rarely	30%	40%	24%	35%	30%	35%	28%
Never	55%	35%	33%	41%	30%	41%	11%

Most the Afghanistan people never open a new package of food when there is already an open one. 30% reported that they *rarely* do it, 10% *sometimes* do it and 5% *often* do it, only.

A clear majority of the survey participants in Benin *never* (35%) or *rarely* (40%) open a new package of food when there is already an open one. Only 10% reported to *often* do so.

Many the Cameroonian participants *never* (33%) or *rarely* (24%) open a new package of food when there is already an open one. However, 42% state that they open a new package of food when there is already an open one at least *sometimes*.

The clear majority of the Saudi participants *never* (41%) or *rarely* (36%) open a new package of food when there is already an open one. Only 20% *sometimes* do so whereas almost none of them *often* (2%) or *always* (2%) open a new package of food when there is already an open one.

Many the survey participants in Senegal *never* (30%) or *rarely* (30%) open a new package of food when there is already an open one.

Among all Turkish participants, 41% never and 35% rarely open a new package of food when there is already an open one.

Uzbekistan people were divided as for the frequency of opening a new package of food when there is an open one. 17% answered *always* or *often*, 28 answered *sometimes* or *rarely* and 11% answered *never.*

Table 63: Frequency of checking the expiration dates when going to purchase a product

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Always	20%	40%	65%	23%	40%	75%	65%
Often	25%	20%	13%	17%	10%	19%	15%
Sometimes	20%	10%	16%	42%	25%	5%	5%
Rarely	25%	5%	4%	16%	15%	1%	10%
Never	10%	25%	1%	3%	10%	0%	5%

Afghanistan participants were quite divided as for checking the expiration date of the products that they purchase and no majority emerges. 20% reported to *always* check the expiration date, 25% to *often* do it, 20% *sometimes*, 25% *rarely* and 10% reported to *never* check.

The majority (60%) of the Beninese participants stated that they check the expiration date of the products that they purchase at least *often*. 25% *never* pay attention to the expiration date of the food items they purchase.

In Cameroon, the clear majority (79%) of the survey participants stated that they check the expiration date of the products that they purchase at least *often*. Almost none of them stated that they rarely (4%) or never (1%) check the expiration date of the products that they purchase.

The clear majority (82%) of the survey participants from Saudi Arabia stated that they check the expiration date of the products that they purchase sometimes or more frequently. Few of them rarely (16%) or never (3%) check it.

In Senegal, half of the participants stated that they check the expiration date of the products that they purchase at least *often*. 75% pay attention to the expiration date of the food items they purchase at least *sometimes*.

Clear majority of the Turkish participants stated that the check the expiration date of the products when they purchase them. There is no respondent who said that s/he never checks the expiration dates.

In Uzbekistan, a clear majority of the participants stated that they check the expiration date of the products that they purchase at least *often*.

Table 64. Frequency of increasing food purchases in cases of promotion

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Always	30%	0%	20%	17%	0%	11%	30%
Often	35%	10%	24%	23%	30%	25%	20%
Sometimes	35%	10%	36%	25%	15%	36%	15%
Rarely	0%	35%	12%	34%	15%	24%	20%
Never	0%	45%	8%	2%	40%	4%	15%

In Afghanistan, 65% of respondents that reported that they *often* (20%) or *always* (30%) increase their food purchases in case of promotion and all of them so it at least *sometimes*.

In Benin, there is a clear majority of respondents that reported that they *rarely* (35%)or *never* (45%) increase their food purchases in case of promotion. Only a small minority of them *sometimes* (10%) or *often* (10%) increase their purchases in case of promotion.

In Cameroon, there is a clear majority of respondents that reported to increase their food purchases at least *sometimes* in case of promotion (80%). Only a small minority of them *rarely* (12,00%) or *never* (8,00%) increase them in case of promotion.

33,91% of the persons surveyed in Saudi Arabia stated that they *rarely* increase their food purchases when there is a promotion. however, the clear majority of them do it *sometimes* or more frequently.

In Senegal, a big half of respondents that reported that they *rarely* (15%) or *never* (40%) increase their food purchases in case of promotion. 70% do it *sometimes*, at the most.

Slightly more than a quarter of the Turkish respondents stated that they often (25%) increase their food purchases when there is a promotion. 36% reported to do it sometimes. The percentage of the survey participants who never increase their purchase is 4%.

In Uzbekistan, half of respondents that reported that they *often* (20%)or *always* (30%) increase their food purchases in case of promotion. The other half do it *sometimes*, at the most. They are 15% to never do it, 20% to do it *rarely*, and 15% to *sometimes* do it.

Table 65: Degree of agreement with the statement "discarded food packaging is a greater environmental concern than food waste"

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully agreed	0%	5%	37%	23%	20%	21%	65%
Agreed	35%	40%	37%	67%	50%	52%	20%
Don't know	45%	45%	15%	6%	25%	21%	10%
Not agreed	20%	10%	7%	3%	5%	6%	5%
No Agreed at all	0%	0%	3%	2%	0%	4%	0%

Afghanistan people are quite divided as for the statement according to which discarded food packaging is a greater environmental concern than food waste. While 35% *agreed* and 20% *disagreed*, they were 45% not to know what to answer.

45% of the Beninese do not know what to think about the statement according to which "discarded food packaging is a greater environmental concern than food waste". Most of those who answered *agreed* (40%) or *fully agreed* (5%) and only 10% disagreed.

The clear majority of the Saudi *agreed* (37%) or *fully agreed* (37%) with the statement "discarded food packaging is a greater environmental concern than food waste". Very few of them disagreed.

25% of the Senegalese do not know what to think about the statement according to which "discarded food packaging is a greater environmental concern than food waste", most of the others agreed (50%) or fully agreed with it (20%). Only 5% disagreed.

In Turkey, 73% of all respondents found discarded food packaging a greater environmental concern than food waste.

The clear majority of the people surveyed in Uzbekistan (85%) either *agreed* or *fully agreed* that discarded food packaging is a greater environmental concern than food waste. They were only 5% to disagreed with this statement.

Table 66: Degree of agreement with the statement "food waste is not a problem as it is natural and biodegradable"

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	0%	5%	26%	36%	5%	6%	35%
Agreed	10%	60%	45%	23%	50%	21%	15%
Don't Know	35%	10%	12%	7%	15%	17%	20%
Not agreed	50%	25%	14%	30%	15%	46%	15%
No Agreed at all	5%	0%	3%	10%	15%	10%	15%

Most respondents to the survey lead in Afghanistan stated that they *disagree* (50%) or that they *don't agree at all* (5%) with the statement according to which food waste is a problem even if its biodegradable. They were only 10% to agree with this statement, whereas 35% didn't know.

A clear majority of the respondents to the survey in Benin stated that they *fully agreed* (5%) or *agreed* (60%) with the statement "Food waste is not a problem as it is natural and biodegradable" whereas 25% disagreed.

A clear majority of the respondents to the survey in Cameroon stated that they *fully agreed* (26,00%) or *agreed* (45%) with the statement "Food waste is not a problem as it is natural and biodegradable" whereas 17,00% disagreed.

36% of the respondents to the survey in Saudi Arabia stated that they fully agreed with the statement "Food waste is not a problem as it is natural and biodegradable" whereas 29% disagreed with that. They are 23% to agree and 10% to fully disagree with this statement.

A short majority of the respondents to the survey in Senegal stated that they *fully agreed* (5%) or *agreed* (50%) with the statement "Food waste is not a problem as it is natural and biodegradable" whereas 30% disagreed.

As the survey data indicates, 46% of the Turkish participants did not agree with the statement "Food waste is not a problem as it is natural and biodegradable". However, 27% agreed with it.

Half of the respondents to the survey lead in Uzbekistan stated that they *fully agreed* (35%) or *agreed* (15%) with the statement "Food waste is not a problem as it is natural and biodegradable" whereas 30% *disagreed* (15%) or *did not agree* (15%) at all and 20% did not know what to answer.

Table 67: Degree of agreement with the statement "I don't really care about the amount of food waste that I throw away"

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	0%	10%	14%	33%	5%	0%	35%
Agreed	50%	40%	26%	18%	35%	1%	20%
Don't Know	5%	0%	13%	3%	35%	2%	0%
Not agreed	45%	35%	27%	32%	20%	52%	15%
No Agreed at all	0%	15%	20%	14%	5%	45%	30%

Afghanistan respondents are quite divided regarding the fact of caring with the amount of food they throw away. If 50% state to care of the amount of food that they throw away, 45% don't state to care about it, which represents a strong minority.

Beninese respondents are completely divided regarding the fact of caring with the amount of food they throw away (half agreed while the other half *disagreed*).

Respondents to the survey in Cameroon are quite divided again as for the fact of caring with the amount of food that they throw away. Indeed 40% *agreed* while 47% *disagreed*.

A small majority of the Saudi respondents reported that they *agreed* (18%) or *fully agreed* (33%) with the statement "I don't really care about the amount of food waste that I throw away" while a very strong minority *did not agree* (32%) or *fully disagreed* (14%) with this.

Senegalese respondents are rather divided regarding the fact of caring with the amount of food they throw away. This is especially because 35% didn't know what to answer to this statement. For the rest, 35% agreed whereas 20% disagreed. And they were 5% to fully agree or to completely disagree.

Turkish respondents reported in the clear majority (97%) that they are concerned about the amount of food waste they throw away.

Uzbekistan respondents are quite divided regarding the fact of caring with the amount of food they throw away. If 55% state to care or to care very much, 45% don't state to care or not to care at all about it, which represents a strong minority.

Table 68: Degree of agreement with the statement "I try to make sure the food thrown away is kept to a minimum"

Frequency	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	10%	30%	32%	36%	25%	54%	65%
Agreed	25%	65%	41%	56%	30%	44%	30%
Don't Know	5%	0%	14%	3%	35%	0%	5%
Not agreed	60%	5%	9%	4%	10%	1%	0%
No Agreed at all	0%	0%	4%	1%	0%	2%	0%

Many the Afghanistan respondents stated that they do not try to keep the food thrown away to the minimum, whereas 35% stated that they try to do it and 5% didn't know.

Almost all the persons surveyed in Benin (95%) stated that they try to keep the food thrown away to the minimum.

The clear majority of the persons surveyed in Cameroon (73%) stated that they try to keep the food thrown away to the minimum. Only 13% of them do not agree with this statement.

The clear majority (92%) of the persons surveyed in Saudi Arabia stated that they try to keep the food thrown away to the minimum. Only around 5% of them do not agree with this statement.

Most Senegalese (55%) stated that they try to keep the food thrown away to the minimum. "Don't know" receives the highest rate of answers. Only 10% disagreed.

Clear majority of the Turkish respondents (91%) stated that they try to make sure the food thrown away is kept to a minimum. Only 3% did not agree with that.

Almost all the Uzbekistan respondents state that they try to keep the food thrown away to the minimum. Indeed, 65% *fully agreed* and 30% *agreed*.

Table 69: Degree of agreement with the statement "If I had knowledge on how to best store food I would probably end up throwing away less"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	0%	50%	46%	48%	30%	17%	50%
Agreed	65%	50%	35%	46%	35%	34%	20%
Don't Know	15%	0%	11%	2%	25%	25%	5%
Not agreed	20%	0%	7%	4%	5%	22%	15%
No Agreed at all	0%	0%	0%	0%	5%	2%	10%

65% of the Afghanistan respondents *agreed* that they would probably end up throwing less if they had knowledge on how to best store food, while 20% disagreed with this idea.

All the Beninese respondents stated that they would probably end up throwing less if they had knowledge on how to best store food.

The clear majority (82%) of the Cameroonian respondents stated that if they had knowledge on how to best store food they would probably end up throwing away less, whereas less than 7% disagreed with this statement.

The clear majority (94%) of the Saudi respondents stated that if they had knowledge on how to best store food they would probably end up throwing away less, whereas less than 5% disagreed with this statement.

65% of the Senegalese respondents *agreed* (35%) or *fully agreed* (30%) that they would probably end up throwing less if they had knowledge on how to best store food. Only 10% disagreed whereas the "don't know" choice received a high rate of answers again.

51% of the Turkish participants agreed with that if they had knowledge on how to best store food they would probably end up throwing away less. Almost a quarter of all respondents (25%) said that they do not know. On the other hand, 24% did not agree with this suggestion.

70% of the Uzbekistan respondents *agreed* (35%) or *fully agreed* (30%) that they would probably end up throwing less if they had knowledge on how to best store food. They were 15% to *disagree* and 10% *not to agree at all*.

Table 70: Degree of agreement with the statement "If I had knowledge on how to do food shopping more effectively, I would probably end up throwing away less"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	5%	25%	38%	55%	20%	8%	50%
Agreed	45%	70%	43%	42%	40%	50%	25%
Don't Know	15%	5%	8%	1%	25%	21%	10%
Not agreed	35%	0%	7%	2%	10%	19%	15%
No Agreed at all	0%	0%	4%	0%	5%	2%	0%

Half of the surveyed households in Afghanistan *agreed* (45%) or *fully agreed* (5%) with the statement "If I had knowledge on how to do food shopping more effectively, I would probably end up throwing away less". They were only 35% to *disagree* as 15% didn't know what to answer.

Almost all the Beninese (95%) *agreed* or *fully agreed* with the statement "If I had knowledge on how to do food shopping more effectively, I would probably end up throwing away less".

In the same way, a clear majority of Cameroonian (81%) agreed with the statement "If I had knowledge on how to do food shopping more effectively, I would probably end up throwing away less".

Almost all (97%) the respondents to the survey in Saudi Arabia agree with the statement "If I had knowledge on how to do food shopping more effectively, I would probably end up throwing away less".

In Senegal, a majority also *agreed* (40%) or *fully agreed* (20%) with the statement "If I had knowledge on how to do food shopping more effectively, I would probably end up throwing away less".

Almost half of the Turkish respondents (50%) thought that if they had knowledge on how to do food shopping more effectively, they would throw away less. In contrast, 21% did not agree and another 21% of the respondents stated that they do not know.

A vast majority of the surveyed households in Uzbekistan *agreed* (25%) or *fully agreed* (50%) with the statement "If I had knowledge on how to do food shopping more effectively, I would probably end up throwing away less". They were only 15% to *disagree* as 10% didn't know what to answer.

Table 71: Degree of agreement with the statement "If I had knowledge on the environmental impact of food waste, I would probably try to throw away less"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	0%	40%	44%	44%	5%	16%	55%
Agreed	35%	55%	38%	51%	25%	61%	30%
Don't Know	30%	0%	14%	3%	35%	8%	5%
Not agreed	35%	5%	4%	1%	20%	14%	0%
No Agreed at all	0%	0%	0%	1%	15%	2%	10%

Afghanistan people households were completely divided as for the following statement: "if I had knowledge on the environmental impact of food waste, I would probably try to throw away less". Indeed, 35% *agreed* and 35% *disagreed*. Also, 3% didn't know what to answer.

In Benin, 95% stated that if they if they had knowledge on the environmental impact of food waste, they would try to throw away less.

In Cameroon, a strong majority (82%) also stated that if they if they had knowledge on the environmental impact of food waste, they would try to throw away less.

Almost all the Saudi respondents (96%) also stated that if they if they had knowledge on the environmental impact of food waste, they would try to throw away less.

Senegalese participants to the survey are divided regarding the statement "if I had knowledge on the environmental impact of food waste, I would probably try to throw away less". 30% agreed or fully agreed while 35% disagreed or fully disagreed and 35% didn't know what to answer.

Majority of the survey participants (76%) to the survey lead in Turkey agreed that if they had knowledge on the environmental impact of food waste, they would try to throw away less. 16% did not agree with this premise.

There is a clear majority of Uzbekistan respondents that *agreed* (30%) or *disagreed* (55%) with the following statement: "if I had knowledge on the environmental impact of food waste, I would probably try to throw away less". Only 10% *did not agreed at all*.

Table 72: Degree of agreement with the statement "I care about food poisoning so try to be careful about food storage"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	26%	45%	40%	48%	20%	31%	85%
Agreed	32%	55%	44%	47%	20%	52%	15%
Don't Know	11%	0%	10%	1%	5%	13%	5%
Not agreed	32%	0%	4%	4%	20%	3%	20%
No Agreed at all	0%	0%	2%	1%	35%	1%	35%

Most the participants to the survey lead in Afghanistan *agreed* (35%) or *fully agreed* (26%) with the statement according to which they try to be careful about food storage because they care about food poisoning. They were 32% to disagree while 11% didn't know.

Every Beninese *agreed* or *fully agreed* with the statement " I care about food poisoning so try to be careful about food storage", while a small minority (5%) of disagreed or fully disagreed.

In Cameroon, a very big majority (82%) of the persons surveyed *agreed* or *fully agreed* with the statement " I care about food poisoning so try to be careful about food storage", whereas a small minority (6%) of them disagreed or fully disagreed.

In Saudi Arabia, almost all (95%) of the persons surveyed agreed or fully agreed with the statement " I care about food poisoning so try to be careful about food storage", whereas a small minority (4%) of them disagreed or fully disagreed.

Regarding the statement according to which they try to be careful about food storage because they care about food poisoning, 40% of the Senegalese *agreed* (20%) or *fully agreed* (20%) while 55% *disagreed* (20%) or *completely disagreed* (35%).

More than half of the Turkish respondent agreed (52%) and 31% fully agreed with the statement saying "I care about food poisoning so try to be careful about food storage". The percentages of the people that did not agree or did not agree at all were much less. Also, 13% of all participants answered as they do not know.

All the Uzbekistan participants to the survey lead in Uzbekistan agreed with the statement according to which they try to be careful about food storage because they care about food poisoning.

Table 73: Degree of agreement with the statement "A lot of food waste is down to cooking or preparing too much diet"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	85%	5%	32%	46%	10%	35%	30%
Agreed	15%	45%	45%	44%	30%	52%	15%
Don't Know	0%	10%	11%	3%	35%	7%	40%
Not agreed	0%	35%	9%	6%	20%	5%	5%
No Agreed at all	0%	5%	3%	0%	5%	1%	10%

This table highlights that all the participants agreed that a lot of food waste is down to cooking or preparing too much diet.

Half of the people surveyed in Benin *agreed* or *fully agreed* with that "a lot of food waste is down to cooking or preparing too much diet". A strong minority, though, disagreed with this (40%).

The clear majority (77%) of the people surveyed in Cameroon agreed with that "a lot of food waste is down to cooking or preparing too much diet". Only 12% of them disagreed with this statement when 11% did not know.

The vast majority (90%) of the people surveyed in Saudi Arabia agreed with that "a lot of food waste is down to cooking or preparing too much diet". Only 6% of them disagreed with this statement when 3% don't know.

Half of the people surveyed in Senegal are rather divided again as for the following statement: "a lot of food waste is down to cooking or preparing too much diet". They were 40% to agreed and 25% to disagree but they were also 35% who did not know what to answer.

It is possible to see that 87% of the Turkish participants thought with that "A lot of food waste is down to cooking or preparing too much diet".

40% of the people surveyed in Uzbekistan *didn't know* what to answer to the statement according to which a lot of food waste is down to cooking or preparing too much diet than those who agreed (45%, when *agreed* and *fully agreed* choices are aggregated).

Table 74: Degree of agreement with the statement "A lot of food waste is down to store promotions and different offers"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	10%	5%	16%	36%	10%	16%	21%
Agreed	25%	30%	23%	50%	50%	47%	11%
Don't Know	60%	35%	25%	4%	30%	17%	32%
Not agreed	5%	20%	25%	8%	10%	17%	21%
No Agreed at all	0%	10%	11%	2%	0%	4%	16%

Most the Afghanistan participants to the survey didn't know what to answer to the statement " A lot of food waste is down to store promotions and different offers". Many those who knew what to answer agreed with it (35% in total).

Beninese surveyed are divided as for the question "A lot of food waste is down to store promotions and different offers". 35% did not know what to answer, 35% *agreed* or *fully agreed* and 30% *disagreed* or *fully disagreed*.

Cameroonian surveyed are divided as for the question "A lot of food waste is down to store promotions and different offers". A quarter of them disagreed, while the same share didn't know and another similar percentage agreed (23%). 16% fully agreed when 11% did not agreed at all.

In Saudi Arabia, 50% of the respondents agreed and that 36% of them fully agreed with the statement according to which a lot of food waste is down to store promotions and different offers. On less than 10% disagreed.

60% of the Senegalese are divided agreed or fully agreed with the statement " A lot of food waste is down to store promotions and different offers". If only 10% disagreed, 30% didn't know what to answer.

Table 41 indicates that 62% of the Turkish respondents agreed with that "A lot of food waste is down to store promotions and different offers". However, 21% of them did not agree. Moreover, 17% of the respondents stated that they do not know.

Uzbekistan participants that answered to this question were rather divided in their choices. If 21% *fully agreed* and 11% *agreed*, 21% *disagreed* while 16% *did not agree at all*. The most chosen proposition was *don't know*, with 32% of the respondents.

Table 75: Degree of agreement with the statement "A lot of food waste is down to the kids"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	25%	30%	21%	38%	0%	16%	50%
Agreed	50%	35%	36%	46%	35%	29%	30%
Don't Know	15%	5%	14%	1%	45%	19%	15%
Not agreed	10%	25%	23%	10%	10%	32%	5%
No Agreed at all	0%	5%	6%	4%	10%	4%	0%

A clear majority of the respondents *agreed* (50%) or *fully agreed* (25%) with the statement according to which a lot of food waste is down to the kids. While 10% *disagreed*, 15% *didn't* know.

Most the Beninese *agreed* (35%) or *fully agreed* (30%) with the statement according to which a lot of food waste is due to the kids. However, there is a strong minority of disagreement (30% in total).

Many the persons interviewed in Cameroon agreed (36%) or fully agreed (21%) with the statement according to which a lot of food waste is due to the kids. Only 23% disagreed and 6% did not agree at all.

The vast majority the Saudi agreed (46%) or fully agreed (38%) with the statement according to which a lot of food waste is due to the kids. Only 10% disagreed and 4% did not agree at all.

In Senegal, many the respondents who had a mind regarding the above-mentioned statement agreed with it (35%). The fact is that almost the half of them didn't know what to say regarding the statement according to which a lot of food waste is down to the kids (45%).

Of all the Turkish respondents, 38% did not think that "A lot of food waste is down to the kids", whereas 44% of participants agreed with the premise. Also, 19% said that they do not know.

A clear majority of Uzbekistan respondents agreed with the above-mentioned statement. 50% *fully agreed* and 30% *agreed*. Only 5% *disagreed* with that a lot of food waste is down to the kids.

Table 76: Degree of agreement with the statement "I feel embarrassed to take home the leftover food"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	10%	5%	21%	27%	38%	0%	21%
Agreed	15%	55%	30%	50%	16%	2%	26%
Don't Know	35%	10%	10%	0%	17%	19%	5%
Not agreed	35%	25%	28%	16%	14%	57%	11%
No Agreed at all	5%	5%	10%	8%	16%	22%	37%

In Afghanistan, there were no majority that had emerged about the statement "I feel embarrassed to take home the leftover food". 35% *didn't know* what to answer and 35% *didn't agree*. They were 40% to disagree in total and 25% to agree when answers are aggregated.

Beninese participants to the survey answered in majority that they feel embarrassed to take back home their food leftovers when they go to the restaurant (60% in total). 30% of them do not feel embarrassed about it.

The answers to the statement "I feel embarrassed to take home the leftover food" were quite varied in Cameroon. While 30% *agreed*, a similar percentage *disagreed* (28%). 21% *fully agreed* and 10% *did not agree* at all.

A strong majority (76%) of the persons interviewed in Saudi Arabia are embarrassed to take their food leftover at home. Less than a quarter of them are not.

Senegalese participants to the survey agreed in majority that they feel embarrassed to take back home their food leftovers when they go to the restaurant (60% in total). 25% of them do not feel embarrassed about it.

In Turkey, around 79% of the participants do not feel embarrassed about taking the leftover food to home.

Uzbekistan participants to the survey were rather divided as for the feeling of being embarrassed to take back home the leftover food. 21% *fully agreed* and 26% *agreed* while 10% *disagreed* and 37% *did not agree at all*.

Table 77: Degree of agreement with the statement "Food business refuse me taking leftover food home"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	10%	5%	10%	46%	50%	0%	0%
Agreed	10%	65%	21%	48%	15%	5%	0%
Don't Know	45%	30%	20%	4%	10%	24%	40%
Not agreed	10%	0%	35%	1%	10%	53%	60%
No Agreed at all	25%	0%	7%	2%	15%	19%	0%

Afghanistan people don't think that the food business places prevent them to take back home their leftover food. If 40% don't know what about that, 60% disagreed.

A strong majority of Beninese stated that food businesses refuse them to take their leftovers back home. However, a strong minority of 30% did not know what to answer.

In Cameroon, the most frequently answer was a disagreement (35%). Around 20% *agreed* and the same proportion of respondents don't know what to think about this statement. 10% fully agreed while 7% completely disagreed with this.

Concerning the answer to the statement "Food businesses refuse me to take the food leftovers at home", the answers are sharply divided in Saudi Arabia. Most of the respondents agreed

(16%) or fully agreed with this statement (38%) but 14% did not agree and 16% completely disagreed with it. Also, 17% had no idea.

65% of the Senegalese respondents stated that food businesses refuse them to take their leftovers back home. 25% disagreed.

In Turkey, a clear majority (71%) did not think food business did not let them to take the leftover food home. The percentage of people stating "Don't Know" was 24%.

Uzbekistan people think that food business does not prevent them to take back home their food leftovers. If 40% don't know what about that, 60% disagreed.

Table 78: Degree of agreement with the statement "Super-sizing food is one of the key trends contributing to leftover food in my order"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	50%	15%	13%	29%	20%	5%	45%
Agreed	15%	75%	36%	57%	45%	33%	25%
Don't Know	5%	10%	28%	7%	10%	25%	15%
Not agreed	15%	0%	17%	6%	20%	34%	5%
No Agreed at all	15%	0%	5%	1%	5%	4%	10%

A strong majority of the people surveyed in Afghanistan agreed (15%) or fully agreed (50%) with the statement according to which supersizing food is one of the key trends contributing to foods leftovers. They were 30% to disagreed whereas 5% didn't know what to answer.

A vast majority of the people surveyed in Benin *agreed* (75%)or *fully agreed* (15%)that super-sizing food is one of the key trends contributing to leftover food.

Half of the Cameroonian people think that super-sizing food is one of the key trends contributing to leftover food. 36% agreed with this statement and 13% fully agreed with it, so almost than the half of the surveyed people. 17% disagreed when 28% don't know what to answer to this statement.

Almost all the Saudi respondents (94%) agreed with the statement according to which that super-sizing food is one of the key reason (trend) contributing to leftover.

Half of the people surveyed in Senegal didn't know what to answer to the statement according to which supersizing food is one of the key trends contributing to foods leftovers. 40% agreed (35%) or fully agreed (5%) while 10% disagreed (5%) or fully disagreed (5%).

Around 37% of the Turkish participants indicated that super-sizing food is one of the key reason (trend) contributing to leftover.

A clear majority of the people surveyed in Uzbekistan agreed (25%) or fully agreed (45%) with the statement according to which supersizing food is one of the key trends contributing to foods leftovers. They were only 15% to disagreed.

Table 79: Degree of agreement with the statement "The way of offering the meal influences the leftover food"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	0%	25%	25%	29%	5%	9%	40%
Agreed	30%	55%	45%	57%	45%	55%	45%
Don't Know	60%	10%	17%	7%	35%	19%	15%
Not agreed	10%	10%	13%	6%	5%	14%	0%
No Agreed at all	0%	0%	0%	1%	10%	3%	0%

Most the Afghanistan respondents didn't know what to think about the statement according to which the way of offering the meal influences the leftover food (60%). 30% think there is an effect whereas 10% didn't.

In Benin, a very big majority of the surveyed people also *agreed* (55%)or *fully agreed* (25%) with the statement according to which the way of offering the meal influences the leftover food. Only 10% disagreed.

A strong majority of the Cameroonian people *agreed* (45%)or *fully agreed* (25%) with the statement according to which the way of offering the meal influences the leftover food. Only 13% disagreed.

57% of the Saudi respondents agreed that the way of offering the meal influences the leftover food and that 29% of them fully agreed with this. Only few respondents disagreed.

In Senegal, half of the respondents agreed (45%) or fully agreed (5%) with the statement "the way of offering the meal influences the leftover food ". Once again, there is a very high rate of participants to the survey that didn't know what to think about that (35%). For the rest, 5% disagreed with this statement and 10% completely disagreed.

Table 45 shows that "The way of offering the meal influences the leftover food" according to 65% of the Turkish participants, whereas and 16% did not agree with the statement.

All the Uzbekistan respondents that knew what to answer *agreed* (45%) or *fully agreed* (40%) with the statement "the way of offering the meal influences the leftover food ".

Table 80: Degree of agreement with the statement "Taking home any leftover food helps minimizing food waste"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	74%	30%	28%	45%	25%	31%	35%
Agreed	26%	60%	50%	46%	25%	59%	45%
Don't Know	0%	5%	14%	2%	40%	6%	20%
Not agreed	0%	5%	4%	5%	10%	3%	0%
No Agreed at all	0%	0%	4%	2%	0%	2%	0%

Every Afghanistan surveyed *agreed* (23%) or *fully agreed* (74%) that taking home any leftover food helps minimizing food.

A vast majority of Beninese respondents *fully agreed* (30%) or *agreed* (60%)with the statement according to which taking back home leftover food helps to minimize food waste.

A clear majority of Cameroonian respondents *fully agreed* (28%) or *agreed* (50%)with the statement according to which taking back home leftover food helps to minimize food waste. Only 4% did not agree and 4% did not agree at all.

Almost all the Saudi participants (91%) responding the survey agreed or fully agreed with the statement according to which taking back home leftover food helps to minimize food waste. Only 5% did not agree and 2% did not agree at all.

If half of the Senegalese respondents agreed (25%) or fully agreed (25%) that taking back home the food leftovers would help to minimize the amount of food waste, the vast majority of the others (40%) didn't know what to think about that and only 10% disagreed.

Of all the Turkish participants, 58. % agreed with "Taking home any leftover food helps minimizing food waste" and 31% of them fully agreed with it. However, only 5% of them did not agree with the suggestion.

All the Uzbekistan respondents who had a mind about what to answer to the above-mentioned statement agreed (45%) or fully agreed (35%) with it. They were 20% not to know what to think.

Table 81: Degree of agreement with the statement "Using smaller buffets helps minimizing food waste"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	40%	40%	37%	37%	10%	17%	45%
Agreed	25%	60%	50%	50%	40%	58%	15%
Don't Know	35%	0%	8%	8%	15%	15%	30%
Not agreed	0%	0%	6%	6%	30%	6%	10%
No Agreed at all	0%	0%	3%	3%	5%	3%	0%

In Afghanistan, nobody disagreed with that using smaller buffets would help to minimize food waste". A strong majority *agreed* or *fully agreed* and 35% didn't know what to think.

All the Beninese surveyed agreed that using smaller buffets would help minimizing food waste.

A clear majority of the Cameroonian surveyed (87%) agreed that using smaller buffets would help minimizing food waste.

Looking at the Table 47, 87% of the Saudi respondents agreed with the statement "using smaller buffets helps minimizing food waste".

40% of the Senegalese respondents agreed that using smaller buffets would help to minimize food waste and 10% fully agreed with this. However, 30% disagreed and 5% did not agree at all.

Most Turkish participants (75%) agreed with the statement "Using smaller buffets helps minimizing food waste".

In Uzbekistan, 60 % of the respondents *agreed* or *fully agreed* that using smaller buffets would help to minimize food waste. 30% *didn't know* and 10% *disagreed*.

Table 82: Degree of agreement with the statement "Encouraging restaurants to sell half portions of food helps minimizing food waste"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	58%	55%	26%	38%	25%	25%	50%
Agreed	42%	45%	36%	39%	15%	46%	30%
Don't Know	0%	17%	17%	10%	25%	20%	15%
Not agreed	0%	15%	15%	10%	15%	6%	5%
No Agreed at all	0%	6%	6%	3%	20%	3%	0%

All the households' respondents surveyed in Afghanistan thought that encouraging restaurants to sell half portions of food helps minimizing food waste.

All the Beninese also agreed with the statement "Encouraging restaurants to sell half portions of food helps minimizing food waste".

In Cameroon, most the people that were surveyed *agreed* (36%) or *fully agreed* (26%) with the statement "Encouraging restaurants to sell half portions of food helps minimizing food waste" while 15% *disagreed* and 6% *didn't agree at all*.

Almost all the Saudi respondents (97%) agreed that encouraging restaurants to sell half of food would help to minimize food waste.

Senegalese surveyed for this study were very divided regarding the above-mentioned statement. While they were 40% to agree or fully agree, they were 35% to disagree or completely disagree. 25% of them didn't know what to answer.

The Table 48 indicates that majority of the Turkish respondents (71%) thought that "Encouraging restaurants to sell half portions of food helps minimizing food waste". 20% of all participants stated that they do not know.

Uzbekistan households *agreed* or *fully agreed* with the statement " encouraging restaurants to sell half portions of food helps minimizing food waste" in 80% of the cases surveyed, while 15% *didn't know* and 5% *disagreed* with it.

Table 83: Degree of agreement with the statement "I am aware of the amount of money thrown away by throwing away the leftover food in restaurant"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	10%	55%	43%	45%	5%	6%	55%
Agreed	35%	45%	32%	45%	45%	28%	35%
Don't Know	10%	0%	14%	3%	20%	39%	5%
Not agreed	45%	0%	6%	7%	15%	23%	5%
No Agreed at all	0%	0%	5%	0%	15%	6%	0%

In Afghanistan, there is a same percentage of participants that were aware (45%) of the amount of money thrown away by throwing away the leftover food in restaurant than as those who were not aware (45%).

In Benin, all the respondents agreed with the following the statement according to which the amount of money thrown away by throwing away the leftover food in restaurant as well.

A clear majority of the Cameroonian respondents to the field survey *agreed* (32%) or *fully agreed* (43%) with the following statement: "I am aware of the amount of money thrown away by throwing away the leftover food in restaurant".

Nearly all the people interviewed in Saudi Arabia (90%) were either aware or fully aware of the amount of money that is lost when food leftovers are thrown away. Only 7% were not aware of it.

While half of the Senegalese respondents did not state that they were aware or fully aware of the amount of money thrown away by throwing away the leftover food in restaurant, 15% were not or not all and 20% didn't know what to say about that.

In Turkey, around 67% of the participants either don't know or not aware about the amount of money throw by the leftovers.

Almost all the respondents to the households' survey lead in Uzbekistan were aware (35%) or fully aware (55%) of the amount of money thrown away by throwing away the leftover food in restaurant.

Amounts of food waste produced in households

Table 84: Average food waste during the preparation of the meals (g) per week

Type of food	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Dairy products	7,200	86	431	810	2,558	3,742	4387,5
Meat, eggs, legumes/seeds	4,650	238	1,079	1,491	3,172	2,615	4,625
Fruits and vegetables	13,850	190	505	1,612	2,234	5,428	9,800
Bread and cereals	18,450	23	548	1,532	1,734	2,164	5,997
Sugar and sweets	1,955	46	200	642	1,304	1,111	2,925
Total	**46,105**	**583**	**2,763**	**6,087**	**11,001**	**15,060**	**17,350**

Looking at Table 50, we can see that Afghanistan households are those who waste by far the most food at the preparation step, follow by Turkish and Uzbekistan households. They waste especially a lot of fruits and vegetables as well as bead and cereals. The respondents that reported to waste the less are the Beninese ones, that reported to waste 582 grams of food per week at the preparation step, they waste particularly few dairy products and sweets. In general, at the preparation step, it is the *sugar and sweets* (8,183g) category that is wasted the less, followed by the *dairy products* (14,826g) category, and it is the *fruits & vegetables* (33,617g) category that is wasted the most followed by the *bread and cereals* (24,450g) category.

Table 85: Average waste during the service (g) per week

Type of food	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Dairy products	7,850	20	463	787	2,507	3,671	3,781
Meat, eggs, legumes/seeds	4,430	51	488	1,359	3,096	2,538	4,228
Fruits and vegetables	12,475	54	409	1,775	2,190	5,146	8,800
Bread and cereals	15,875	12	302	1,342	1,716	2,035	4,629
Sugar and sweets	1,815	25	288	656	1,290	1,103	2,533
Total	**42,445**	**162**	**1,949**	**5,919**	**10,799**	**14,493**	**23,970**

Table 51 shows that Afghanistan households are also those that waste the most food per week at the service step, followed by Uzbekistan and then Senegalese households according to the answers given by the respondents of these respective countries. The country that wastes the less at this step is Benin, followed by Cameroon and then Saudi Arabia. In general, the category of food that is wasted the most at this step is *fruits and vegetables* (30,848g) followed by bread and cereals (25,910g), and the category of food that is wasted the less at this step is *sugar and sweets* (7,710g) followed by *meat, eggs, legumes/seeds* (16,189g).

Table 86: Average weekly plate waste (g)

Type of food	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Dairy products	-	33	217	266	416	69	267
Meat, eggs, legumes/seeds	1	65	212	423	365	49	44
Fruits and vegetables	2	55	397	573	359	80	594
Bread and cereals	10	4	98	419	306	55	373
Sugar and sweets	-	19	106	82	176	11	316
Total	**13**	**176**	**1,031**	**1,763**	**1,623**	**264**	**1,593**

Looking at the Table 52, we can see that Afghanistan households are those that produce the less plate waste, followed by Beninese and then Turkish households. Those that waste the most at

this step are Saudi ones, followed by Senegalese and Uzbekistan ones. Afghanistan households did not report to waste any dairy products, neither sugar and sweets. Saudi households, in comparison, waste especially a lot of fruits and vegetables (573g), however not as much as Uzbekistan ones (593 g). The category of food that is wasted the most is *fruits and vegetables* (2,061g), followed by *dairy products* and *bread and cereals* in the same quantity (respectively 1268 grams and 1,266g). And the category that is wasted the less is *sugar and sweets* (710g), followed by *meat, eggs, legumes/seeds* (1,159g).

2.2 Hospitality Sector

Information on the food businesses

Table 87: Type of business

Type of business	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Coffee	-	14%	22%	9%	9%	15%	55%
Restaurant	65%	52%	51%	32%	64%	56%	25%
Catering company	-	-	-	34%	-	39%	5%
Hotel	10%	10%	8%	6%	9%	14%	5%
Fast food	25%	19%	1%	18%	9%	-	5%
Pub/Bar	-	5%	7%	-	-	10%	-
Other	2%	-	12%	1%	9%	5%	5%

In Afghanistan, hospitality sector places that were the most surveyed were restaurants (65%) and fast foods (25%). The rest of the places were all hotels (10%).

In Benin, hospitality sector place that were the most surveyed were restaurants (52%) and fast foods (19%). 14% of the places surveyed were coffees, 10% were hotels and 5% were pub/bar.

In Cameroon, hospitality sector place that were the most surveyed were restaurants (51%) and coffees (22%). 12% of the places surveyed could not be defined by the given options, therefore stated as "other". They represent the third biggest category of surveyed places. The remaining surveyed places were hotels (8%), pub/bars (7%) and fast foods (1%).

In Saudi Arabia, hospitality sector place that were the most surveyed were catering companies (34%) and restaurants (32%). 18% of the places surveyed were fast foods, 9% were coffee shops and 6% were hotels. 1% of all places could not be defined by the given options, therefore stated as "other".

In Senegal, hospitality sector places that were the most surveyed were restaurants (64%). The rest of the places were equally shared between coffee, hotel, fast food and other places (9,09%).

Out of the Turkish business places surveyed for this research, the majority was restaurants by 56%. Among the rest, there were coffee shops (15%), hotels (14%) and pub/bar (10%). 5% of all places could not be defined by the given options, therefore stated as "other".

In Uzbekistan, hospitality sector places that were the most surveyed were coffees (55%) and restaurants (25%). The rest of the places were equally shared between catering companies, hotels and fast foods and other places (5% each).

Table 88: Number of staff

Number of days	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
1-3	20%	24%	45%	40%	33%	6%	10%
4-6	55%	29%	20%	20%	24%	23%	25%
7-11	20%	24%	20%	19%	24%	24%	35%
11-16	5%	0%	6%	12%	10%	15%	10%
16 and more	0%	24%	9%	9%	10%	32%	20%

20% of the Afghanistan food hospitality places employ 1-3 staff, 55% have 4-6 employees, 20% have 7-10 staff and 5% employ 11-15 staff

According to the data obtained from the Beninese business places, 29% have 4-6 staff, 24% had 1-3 staff, the same amount had 7-10 staff and 24% had 16 staff or more.

In Cameroon, 45% have 1-3 staff, 20% have 4-6 staff, 20% have 7-10 staff, 6% employ 11-15 persons and 9% have 16 employees or more.

According to the survey lead in Saudi Arabia on the hospitality sector, 40% of the business places have 1-3 staff, 20% have 4-6 staff, 19% have 7-10 staff, 12% employ 11-15 persons and 9% have 16 employees or more.

One-third of the Senegal places had 1-3 staff, 24% had 4-6 or 7-10 employees and 10% were employing 11-15 or 16 and more staff.

According to the data obtained from the Turkish business places, 32% have sixteen or more staff, 24% have 7-10 staff, 23% have 4-6, 15% have 11-15 and only 6% have 1-3.

35% of the Uzbekistan food hospitality places employ 7-10 staff, 25% have 4-6 employees, 20% have 16 staff or more and 10% have either 1-3 staff or 11-15 employees.

Table 89: Number of opening days

Number of days	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
4 days	0%	0%	1%	0%	0%	0%	5%
5 days	0%	10%	8%	1%	0%	0%	5%%
6 days	0%	24%	45%	0%	29%	0%	10
Everyday	100%	67%	46%	1%	71%	1%	80%

All the food business places surveyed in Afghanistan open every day. Two third of the food business places surveyed in Benin open every day (67%) or every day (46%). Most of the food business places in Cameroon open 6 days (45%) or everyday (46%). Almost all the business places surveyed in Saudi Arabia (96%) open every day. Clear majority of the food business

places surveyed in Benin open Senegal (71%). 29% open 6 days of the week and none of them reported to open less than 6 days. Among the surveyed 100 business places, 92% is everyday opened. 8% is on 6 days opened. Vast majority of the food business places surveyed in Uzbekistan open every day (80%). 10% open 6 days of the week and 5% open either 5 days or 4 days.

Food waste in business places

Table 90: About the ownership of a separate food waste collection system

Having own system	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
No	95%	39%	39%	4%	5%	83%	45%
Yes	5%	61%	61%	96%	95%	17%	55%
Planning to have	**Afghanistan**	**Benin**	**Cameroon**	**Saudi Arabia**	**Senegal**	**Turkey**	**Uzbekistan**
No	84%	30%	30%	0%	0%	80%	22%
Yes	15%	70%	70%	100%	100%	20%	78%

When the Afghanistan business places were asked about whether they have their own separate food waste collection system or not, almost all of them answered that they do not (95%). Among those who still didn't have their own separate food waste collection system, most of them were not planning to have one (84%). Only 15% were planning plan it.

When the Beninese business places were asked about whether they have their own separate food waste collection system or not, 39% stated that they do not whereas 61% reported to have one.

In Cameroon, when the business places were asked about whether they have their own separate food waste collection system or not, 39% stated that they do not whereas 61% reported to have one. For those that don't have any collection system, when asked if they planned to get one, a clear majority responded *yes*.

When the Saudi business places were asked about whether they have their own separate food waste collection system or not, only 4% stated that they do not. Almost all the business places (96%) surveyed have their own system. For those that don't have any collection system, when asked if they planned to get one, all of them (100%) answered positively.

In Senegal, when the business places were asked about whether they have their own separate food waste collection system or not, almost all of them answered *yes* while 5% answered *no*. All the respondents that didn't have their own separate food waste collection system stated that they were planning to have one.

When the Turkish business places were asked about whether they have their own separate food waste collection system or not, 83% stated that they do not. Only 17% of 100 business places have their own system. Among the business places which do not have their own food waste collection system, only 20% stated that they plan to have one, whereas 80% do not.

In Uzbekistan, when the business places were asked about whether they have their own separate food waste collection system or not, 55% of them answered most all of them answered *yes* while 45% answered *no*. Among those who still don't have their own separate food waste

collection system, 78% stated that they were planning to have one against 22% that do not plan it.

Table 91: Average amount wastage produced per type of food per day

Type of food	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Average kgs							
Meat, chicken & fish	1.9	4.9	1.5	0.2	9.5	4.2	1.6
Fruit	0.0	2.9	1.1	0.3	6.6	1.0	0.7
Vegetables	1.8	2.0	1.5	0.3	8.3	4.2	2.6
Bakery	3.7	0.4	1.3	0.6	7.2	2.0	1.7
Sweets	0.0	0.3	0.7	0.1	5.0	0.2	0.1
Total	**7.4**	**7.2**	**4.3**	**1.1**	**24.9**	**10.4**	**5.9**
Average liters							
Fruit juice	0.0	0.5	0.8	0.2	8.3	1.9	1.1
Carbonated drinks	2.7	0.6	1.6	0.1	7.0	1.5	2.4
Milk	0.0	0.4	0.5	0.3	6.4	0.1	0.2
Yoghurt	0.0	0.1	0.4	0.3	4.7	0.0	0.0
Total	**2.7**	**1.4**	**3.3**	**0.9**	**26.4**	**3.5**	**3.7**

Table 58 allows to understand that the country where the food business places waste the most is Senegal (51.29 kg per day in average), followed by Turkey (13.84 kg per day in average). The country where the food business places waste the less is Saudi Arabia (2.02 kg per day in average), followed by Cameroon (7.58 kg per day in average). The category of food that is wasted the most by the food business places surveyed from the aggregated above mentioned countries is *Meat, chicken & fish* (23.83 kg per day in average), followed by *Vegetables* (20.51 kg per day in average). The category of food that is wasted the less by the food business places surveyed from the aggregated above mentioned countries is *Yoghurt* (5.42 liters per day in average), followed by *Sweets* (6.39 kg per day in average).

Table 92: Ways to dispose solid food waste

Ways	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Donate food collects to charities	0%	0%	5%	0%	24%	4%	5%
Give it to animals	0%	11%	8%	1%	33%	61%	60%
Give it to poor people	0%	0%	3%	0%	29%	1%	0%
Nearest Bin	100%	89%	71%	79%	0%	28%	15%
Special Food Waste Collector	0%	0%	3%	17%	14%	6%	15%
Other	0%	0%	10%	3%	0%	0%	5%

In Afghanistan, all the hospitality places dispose their solid food waste to the nearest bin. In Benin, a clear majority (89%) of the hospitality places dispose their solid food waste to the nearest bin. All those who don't dispose them like this give it to animals (11%). In Cameroon, 71% of the hospitality places dispose their solid food waste to the nearest bin. Most of the others give it to animals (8%) or dispose it in another way (10%). In Saudi Arabia, 79% of the hospitality places dispose their solid food waste to the nearest bin. Most of the others (17%) dispose of these food waste in special food waste collectors. In Senegal, one-third of the surveyed hospitality places dispose their solid food waste by giving it to animals. 29% give it to poor people, 23,1% donate to charities and 14,29% dispose it to special food waste collector. 61% of the interviewed business places reported that they give the solid food waste that they produce to the animals, whereas 28% throws them to the nearest bin. In Uzbekistan, most the hospitality places dispose their solid food waste by giving it to animals and 15% dispose it to the nearest bin or to special food waste collector.

Table 93: Ways to dispose liquid food waste

Ways	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Dispose them to washbasin	85%	47%	15%	10%	5%	88%	0%
Dispose them outside (garden. river. lake. etc.)	15%	47%	25%	1%	0%	0%	0%
Take them to collection sites	0%	0%	7%	85%	33%	3%	74%
Dispose them in the toilets	0%	5%	34%	0%	0%	0%	0%
Give it to charities	0%	0%	8%	0%	43%	0%	0%
Give it to poor people	0%	0%	5%	0%	19%	1%	5%
Other	0%	0%	6%	4%	0%	8%	21%

The clear majority of the Afghanistan hospitality places that answered to the survey reported to dispose their liquid food waste to the washbasin. All the other dispose them outside.

47% of the Beninese hospitality places that answered to the survey reported to dispose their liquid food waste or to the washbasin or outside. The remaining 5% dispose them in the toilets.

34% of the Cameroonian hospitality places that answered to the survey reported to dispose their liquid food waste in the toilets. 25% dispose them outside and 15% dispose them to washbasin. These are the most frequently chosen responses.

The clear majority of the Saudi business entities (88%) take their liquid food waste to collection sites. Many the others (10%) dispose them to washbasin. It should be noted that 4% of the respondents choose the answer "other".

One-third of the Senegalese hospitality places that answered to the survey reported to dispose their liquid food waste to collection sites. 43% state to give it to charities and 19% to poor people.

A clear majority of the surveyed business entities (88%) dispose their liquid food waste to washbasin, whereas 1% give the away to poor people and 3% take them to collection sites. Also, 8% use other ways to dispose their liquid food waste.

The clear majority of the Uzbekistan hospitality places that answered to the survey reported to dispose their liquid food waste to collection sites. 21% choose *other* and 5% give it to poor people.

Table 94: Main reasons for both solid and liquid food waste

Reasons	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Big portions	0%	0%	5%	26%	5%	4%	15%
Expiry date of food	0%	0%	4%	21%	5%	0%	5%
Lack of efficient storage system	0%	0%	6%	3%	5%	0%	0%
Leftovers of customers	65%	84%	73%	45%	43%	28%	65%
Over orders by the customers	20%	11%	3%	1%	29%	68%	15%
Other	15%	5%	9%	4%	14%	0%	0%

For 65% of the surveyed hospitality places in Afghanistan, main reason for both solid and liquid food waste is related with the leftovers of the customers and 15% consider that it is because of over orders by the customers.

For the clear majority of the surveyed hospitality places in Benin (84%), main reasons for both solid and liquid food waste are related with the leftovers of the customers. In Cameroon, main reasons for both solid and liquid food waste are related with the leftovers of the customers (73%).

Main reasons for both solid and liquid food waste is *leftovers of customers* for 45% of the hospitality places surveyed in Saudi Arabia, big portions for 26% of them and expiry date of the food for 21% of them. 4% of these places have another reason than those proposed in the questionnaire.

For 43% of the surveyed hospitality places in Senegal (84%), main reason for both solid and liquid food waste is related with the leftovers of the customers. 29% mention the over orders by the customers and 14% mention another reason.

68% of the Turkish business places expressed that the main reason for food waste is over orders by the customers. 28% stated the left overs of customers and 4% mentioned big portions as main reasons.

For 65% of the surveyed hospitality places in Uzbekistan, main reason for both solid and liquid food waste is related with the leftovers of the customers and 15% consider that it is because of too big portions or because of over orders by the customers.

Table 95: Ways of dispose of food waste like tea bags, coffee granules and vegetable peelings

Ways	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Throw them to normal bin	100%	95%	78%	98%	5%	97%	70%
Special Recycling Centre	0%	0%	14%	1%	71%	2%	15%
Dump them to produce compass	0%	0%	1%	0%	19%	0%	5%
Throw them to septic system	0%	0%	2%	1%	5%	0%	0%
Other	0%	5%	5%	1%	0%	1%	10%

In Afghanistan, all the hospitality places that responded to the survey on food waste stated that they dispose tea bags, coffee granules and vegetable peelings to a normal bin. In Benin, almost all the hospitality places (95%) that responded to the survey answered that they dispose food waste like tea bags, coffee granules and vegetable peelings by throwing them to normal bin. A clear majority of the Cameroonian hospitality places (78%) that responded to the survey answered that they dispose food waste like tea bags, coffee granules and vegetable peelings by throwing them to normal bin or to recycling centers (14%).

In Saudi Arabia, almost all the respondents (98%) to the survey answered that they dispose food waste like tea bags, coffee granules and vegetable peelings by throwing them to normal bin.

For the vast majority of the Senegalese hospitality places (71%) that responded to the survey food waste dispose tea bags, coffee granules and vegetable peelings to a special recycling center. Most the others (19%) dump them to produce compass.

Clear majority of the Turkish business places that were interviewed dispose food waste like tea bags, coffee granules and vegetable peelings by throwing them to normal bin. Only 2% take them to a special recycling center.

In Uzbekistan, the clear majority of the hospitality places (70%) that responded to the survey on food waste stated to dispose tea bags, coffee granules and vegetable peelings to a normal bin. The rest of the respondents stated that they dispose them to a special recycling center (15%), to produce compass (5%) or another place (10%).

Table 96: Percentage of customers who takes home the leftover food

Percentage	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
<15	85%	95%	69%	36%	58%	81%	40%
15-30	10%	5%	21%	13%	43%	11%	25%
30-50	5%	0%	7%	6%	5%	7%	15%
50-70	0%	0%	1%	5%	0%	1%	15%
70+	0%	0%	1%	39%	0%	0%	5%

Vast majority of the Afghanistan hospitality places think that less than 15% of their customers take their leftovers back home. 10% report about 15-30% of their customers and 5% about 30-50 of their customers. Almost all the Beninese food business places answered that less than 15% of their customers take back home their food leftovers (95%). A strong majority (69%) of the Cameroonian business places stated that less than 15% of their customers take back home their food leftovers. 21% reported that 15 to 30% of their customers take back home their food leftovers.

In Saudi Arabia, 36% of the respondent business places stated that less than 15% of their customers take back home their food leftovers. A similar percentage of them (39%), however, answered that more than 70% of their customers take back home their food leftovers. The rest of the surveyed hospitality places are divided in their answers.

Many the Senegalese food business (58%) answered that less than 15% of their customers take back home their food leftovers, whereas 43% that between 15 and 30% take it back home. In Turkey, the clear majority (81%) of the respondent business places stated that less than 15% of their customers take home the leftover food. Moreover, a small percentage of the respondents (1%) reported that the 50-70% of their customers take the leftover food. Uzbekistan hospitality places are quite divided as for the percentage of their customers takes their food leftovers back home. The most chosen answer is *less than 15%* (for 40% of the food businesses surveyed). 25% thought that 15-30% of their customers take their food leftovers back home while 15% either thought that 30-50% were taking them back home or 50-70%.

Table 97: Agreement with the statement "Discarded food packaging is a greater environmental concern than food waste"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	10%	11%	23%	10%	19%	55%	45%
Agreed	35%	53%	35%	78%	67%	11%	10%
Don't Know	35%	21%	24%	5%	14%	3%	20%
Not Agreed	20%	16%	11%	7%	0%	12%	25%
Not Agreed at all	0%	0%	8%	0%	0%	19%	0%

Among the Afghanistan respondents to the survey, 35% didn't know what to answer to the statement according to which discarded food is a greater environmental concern than food

waste. 35% agreed with it, 10% fully agreed and 20% disagreed. Most the Beninese hospitality places (53%) consider that discarded food packaging is a greater environmental concern than food waste. 21% didn't know what to answer, however, while 16% disagreed and 11% fully agreed. Most the Cameroonian hospitality places (58%) considers that discarded food packaging is a greater environmental concern than food waste. 19% disagreed with this while 24% didn't know what to answer.

In Saudi Arabia, the vast majority of the surveyed hospitality places (87%) considers that discarded food packaging is a greater environmental concern than food waste. Only 7% disagreed with this. All the Senegalese respondents that knew what to answer the above-mentioned statement agreed (67%) or fully agreed (19%). 14% didn't know what to answer.

In Turkey, most the interviewed business places (66%) considers discarded food packaging a greater environmental concern than food waste, whereas 31% did not agree with it. For 55% of the respondents to the survey lead in Uzbekistan, discarded food is a greater environmental concern than food waste. It is not the case for 25% while 20% didn't know what to answer

Table 98: Agreement with the statement "Food waste is not a problem as it is natural and biodegradable"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	0%	0%	22%	2%	48%	12%	40%
Agreed	5%	26%	39%	13%	29%	10%	10%
Don't Know	15%	11%	17%	71%	14%	2%	15%
Not Agreed	65%	63%	21%	6%	10%	36%	25%
Not Agreed at all	15%	0%	2%	7%	0%	40%	10%

Table 64 highlights that the vast majority of the Afghanistan hospitality places *disagreed* or *completely disagreed* with the statement "food waste is not a problem as it is natural and biodegradable". They were only 5% to agree with it. In Benin, many business places responding *disagreed* (63%) with the statement "Food Waste is Not a Problem as It is Natural and Biodegradable", while they were 26% to *agree*. In Cameroon, most business places responding *agreed* (39%) or *fully agreed* (22%) with the statement "Food Waste is Not a Problem as It is Natural and Biodegradable", while they were 21% to disagree. Once again, there is a high rate of respondents that did not know what to think about this statement (17%). In Saudi Arabia, a similar percentage of agreement (15%) and of disagreement (14%) with the statement "Food Waste is Not a Problem as It is Natural and Biodegradable" among the food business places surveyed. It is interesting to note that 71% do not know what to answer. In Senegal, most business places responding *agreed* (29%) or *fully agreed* (47%) to the statement "Food Waste is Not a Problem as It is Natural and Biodegradable", while they were 10% to *disagree* 14% who didn't know what to answer.

In Turkey, 76% of the business places that participated in this research did not agree with the premise telling that food waste is not a problem as it is natural and biodegradable. In contrast, 22% agreed with it. In Uzbekistan, half of the hospitality places *agreed* or *fully agreed* with the

statement " food waste is not a problem as it is natural and biodegradable" while 35% *disagreed* or *did not agree at all.*

Table 99: Agreement with the statement "I don't really care about the amount of food waste that I throw away"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	0%	5%	12%	1%	19%	1%	20%
Agreed	70%	26%	25%	6%	43%	1%	10%
Don't Know	0%	0%	11%	1%	38%	1%	0%
Not Agreed	30%	37%	32%	68%	0%	6%	60%
Not Agreed at all	0%	32%	18%	23%	0%	91%	10%

It can be understood from the Table 65 that a strong majority of the food business respondents do not care about the amount of food waste that they throw away 70%, against 30% that care about it. In Benin, more than a majority of the interviewed business places care about the amount of food waste that they throw away (68%) while the rest of them do not (32%). In Cameroon, a half of the interviewed business places care about the amount of food waste that they throw away (50%) while a big minority do not (37%).

In Saudi Arabia, almost all interviewed business places (91%) care about the amount of food waste that they throw away. In Senegal, all the food business respondents who knew what to answer care about the amount of food waste that they throw away (62%). In Turkey, the clear majority of all interviewed business places (97%) care about the amount of food waste that they throw away. In Uzbekistan, a clear majority of the food business respondents do not care about the amount of food waste that they throw away (60% *disagreed* with the statement and 10% *did not agree at all*), whereas 30% care about it (whom 20% *fully agreed*).

Table 100: Agreement with the statement "Flushing food waste into the sewage is not a problem"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	0%	0%	11%	2%	29%	2%	10%
Agreed	0%	63%	17%	2%	29%	0%	5%
Don't Know	0%	0%	20%	10%	19%	0%	10%
Not Agreed	45%	37%	32%	63%	19%	6%	30%
Not Agreed at all	55%	0%	21%	23%	5%	92%	45%

All the Afghanistan participants to the survey stated that flushing food waste into the sewage is a problem. A majority (63%) of the food business places surveyed in Benin think that flushing food waste into the sewage is not a problem whereas 37% do. 52% of the food business places surveyed in Cameroon think that flushing food waste into the sewage is a problem. Whereas 28% do not think it is a problem, around a fifth of the respondents didn't know what to think about it 20%. 86% of the food business places surveyed in Saudi Arabia think that flushing food waste into the sewage is a problem. Whereas 4% do not think it is a problem, 10% don't know.

A majority (57%) of the food business places surveyed in Senegal think that flushing food waste into the sewage is not a problem. They were 24% to disagree with this. In Turkey, almost all the business places that were surveyed (98%) think that flushing food waste into the sewage is a problem. A vast majority (75%) of the food business places surveyed in Uzbekistan think that flushing food waste into the sewage is a problem. Indeed, 30% of the participants disagreed with the above-mentioned statement and 45% did not agree at all. They were only 15% to think that flushing food waste into the sewage is not a problem.

Table 101: Agreement with the statement "I try to make sure the food thrown away is kept to a minimum"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	0%	5%	29%	5%	43%	85%	65%
Agreed	30%	74%	45%	92%	24%	7%	30%
Don't Know	0%	5%	13%	1%	19%	0%	0%
Not Agreed	70%	16%	10%	1%	14%	1%	5%
Not agreed at all	0%	0%	2%	0%	0%	7%	0%

A strong majority of the Afghanistan respondents do not try to their food wastage to a minimum (70%). Only 30% reported to try to. A strong majority of the Beninese business places surveyed (74%) stated that they make sure the food thrown away is kept to a minimum. A strong majority of the business places surveyed in Cameroon (75%) stated that they make sure the food thrown away is kept to a minimum. In Saudi Arabia, almost all the surveyed places (98%) stated that they make sure the food thrown away is kept to a minimum.

A strong majority of the business places surveyed in Senegal (70%) stated that they make sure the food thrown away is kept to a minimum. None of the participants disagreed. 30% didn't know what to answer. In Turkey, the clear majority of the respondent business places (92%) make sure the food thrown away is kept to a minimum. Almost all the business places surveyed in Uzbekistan (95%) stated that they make sure the food thrown away is kept to a minimum whereas as 5 don't.

Table 102: Agreement with the statement "If I had knowledge on how to best store food I would probably end up throwing away less"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	0%	11%	35%	9%	57%	60%	55%
Agreed	20%	84%	40%	89%	14%	6%	15%
Don't Know	40%	5%	16%	2%	24%	1%	0%
Not Agreed	40%	0%	7%	0%	5%	28%	30%
Not agreed at all	0%	0%	2%	0%	0%	5%	0%

Afghanistan hospitality places do not especially think that they would probably end up throwing away less if they had knowledge on how to store food. 40% don't know about it, and 40% disagreed while only 20% agreed. In Benin, almost all the food hospitality places also *agreed* (84%) or *fully agreed* (11%) with that if they had knowledge on how to store the best, they

would end up wasting less. Nobody disagreed with this. A similar strong majority of the Cameroonian food hospitality places also agreed (40%) or fully agreed (35%) with that if they had knowledge on how to store the best, they would end up wasting less. A very low minority disagreed with this statement.

In Saudi Arabia, almost all the food business places (98%) also agree with that if they had knowledge on how to store the best, they would end up wasting less. None of them disagree with this. Most the Senegalese food hospitality places also *agreed* (24%) or *fully agreed* (43%) with that if they had knowledge on how to better store the foodstuffs, they would end up wasting less. 14% did not agreed. Table 69 shows that 66% of all interviewed business places agreed with that if they had knowledge on how to store the best, they would end up wasting less. In contrast, 33% did not agree with this. Most the food hospitality places in Uzbekistan also *agreed* (15%) or *fully agreed* (55%) with that if they had knowledge on how to better store the foodstuffs, they would end up wasting less. They were 30% to disagree with this statement.

Table 103: Agreement with the statement "If I had knowledge on how to do food shopping more effectively, I would probably end up throwing away less"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	0%	21%	34%	13%	57%	58%	55%
Agreed	20%	74%	45%	85%	14%	8%	20%
Don't Know	30%	0%	11%	2%	24%	4%	10%
Not Agreed	50%	5%	6%	0%	5%	27%	15%
Not agreed at all	0%	0%	4%	0%	0%	3%	0%

Half of the food businesses surveyed in Afghanistan disagreed with the statement "If I had knowledge on how to do food shopping more effectively, I would probably end up throwing away less". They were 20% to agree, and there was also a high rate of respondents who didn't know what to answer. Almost all the food businesses surveyed in Benin *agreed* (74%) or *fully agreed* (21%) with the statement "If I Had knowledge on how to do food shopping more effectively, I would probably end up throwing away less". In Cameroon, 45% of the hospitality sector agreed with the statement "If I Had Knowledge on How to Do Food Shopping More Effectively, I Would Probably End Up Throwing Away Less" and 34% fully agreed with this. In total, they make up a very strong majority of agreement. Very few respondents disagreed. There were once again more respondents that didn't know what to answer than disagreements.

In Saudi Arabia, almost all the food business places interviewed in the scope of this survey agrees with the statement "If I Had Knowledge on How to Do Food Shopping More Effectively, I Would Probably End Up Throwing Away Less". None of them disagreed with this statement. A strong majority of the food businesses surveyed in Senegal also *agreed* (14%) or *fully agreed* (57%) with the statement "If I had knowledge on how to do food shopping more effectively, I would probably end up throwing away less". There is again a high rate of respondents that didn't know what to answer (24%).

In Turkey, of all surveyed business entities, 66% think that they would waste less if they had knowledge on how to do food shopping more effectively. 37%, on the other hand, did not agree with this premise. In Uzbekistan, two-thirds of the food businesses surveyed in Senegal also *agreed* (20%) or *fully agreed* (55%) with the statement "If I had knowledge on how to do food shopping more effectively, I would probably end up throwing away less". 15% disagreed with the latter while 10% didn't know what to answer.

Table 104: Agreement with the statement "If I had knowledge on the environmental impact of food waste, I would probably try to throw away less"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	5%	32%	31%	49%	33%	64%	70%
Agreed	45%	68%	53%	49%	29%	12%	30%
Don't Know	20%	0%	10%	1%	19%	1%	0%
Not Agreed	30%	0%	6%	0%	14%	21%	0%
Not agreed at all	0%	0%	0%	0%	5%	2%	0%

In Afghanistan, half of the food business participants *agreed* or *fully agreed* that if they had a knowledge on the environmental impact of food waste, I would probably try to throw away less, whereas 30% didn't disagreed and 20% didn't know. In Benin, all the business places *agreed* or *fully agreed* that they would try to throw away less if they had knowledge on the environmental impact of food waste. 84% of the Cameroonian business places agreed that they would try to throw away less if they had knowledge on the environmental impact of food waste. Only 5% disagreed with this idea.

In Saudi Arabia, 90% of the business places agreed that they would try to throw away less if they had knowledge on the environmental impact of food waste. Once again in that country, none of them disagreed with this idea. Of all the business places surveyed in Senegal, one-third *fully agreed*, 29% *agreed*, 19% *did not know*, 14% *disagreed* and 5% *did not agree at all* that if they had knowledge on the environmental impact of food waste.

In Turkey, 76% of the business places agreed that they would try to throw away less if they had knowledge on the environmental impact of food waste. 24% did not agree with this idea. All the Uzbekistan food hospitality places agreed (70% *fully agreed* and 30% *agreed*) that if they had a knowledge on the environmental impact of food waste, I would probably try to throw away less.

Table 105: Agreement with the statement "I care about food poisoning so try to be careful about food storage"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	0%	37%	28%	33%	24%	95%	75%
Agreed	80%	53%	55%	62%	29%	4%	25%
Don't Know	15%	0%	6%	1%	29%	1%	0%
Not Agreed	5%	11%	7%	2%	14%	0%	0%
Not agreed at all	0%	0%	3%	1%	5%	0%	0%

Among the food businesses surveyed in Afghanistan, a vast majority to care about food poisoning and therefore try to be careful about food storage (80%) while 5% reported not to be careful. In Benin, a clear majority of the food business places surveyed (89%) revealed that they care about food poisoning and thus try to be careful about food storage. Only 11% don't care about food poisoning. A big majority of the food business places surveyed in Cameroon (83%) revealed that they care about food poisoning and thus try to be careful about food storage. 7% disagreed and 3% did not agree at all with this.

Almost all the Saudi food business places surveyed (96%) revealed that they care about food poisoning and thus try to be careful about food storage. Only 3% of them did not agree. Senegalese food businesses are quite divided as for responding to the statement "I care about food poisoning so I try to be careful about food storage" 24% *fully agreed*, 29% *agreed*, 29% *didn't know*, 14% *did not agree* and 5% *did not agree at all*. Even though, there is a majority that agrees (52%) against a minority that disagrees (19%) when answers are aggregated.

As Table 71 indicates, almost all interviewed business places 99% revealed that they care about food poisoning and thus try to be careful about food storage. All the food businesses also reported to care about food poisoning and therefore try to be careful about food storage (with 75% that *fully agreed* and 25% that *agreed*) in Uzbekistan.

Table 106: Agreement with the statement "I believe that use of food waste in a useful way is an important part of my work"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	0%	32%	25%	33%	14%	51%	50%
Agreed	0%	53%	35%	61%	57%	10%	25%
Don't Know	0%	11%	19%	2%	10%	1%	15%
Not Agreed	10%	5%	14%	4%	19%	27%	5%
Not agreed at all	90%	0%	7%	0%	0%	11%	5%

None of the Afghanistan hospitality places believe that managing the food wastage is an important part of their job. 84% of the hospitality places in Benin believed that the use of food waste in a useful way is an important part of their work whereas 11% didn't know and 5% disagreed. 61% of the Cameroonian hospitality places believed the that use of food waste in a

useful way is an important part of their work. Interestingly, 19% of them did not know what to think about this statement. Also, 21% think that this is not about their business.

97% of the Saudi businesses believed that use of food waste in a useful way is an important part of their work whereas 4% did not think so. In Senegal, there is a strong majority of 71% of the hospitality places that believed the use of food waste in a useful way is an important part of their work whereas 19% disagreed with this belief. In Turkey, 61% of all interviewed business places believed that use of food waste in a useful way is an important part of their work, whereas 38% did not agree with this premise. In Uzbekistan, a clear majority of the hospitality places that believed the use of food waste in a useful way is an important part of their work whereas 10% *disagreed* or *did not agree* at all with this belief.

Table 107: Agreement with the statement "A lot of food waste is down to cooking or preparing too much diet"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	45%	5%	25%	25%	38%	44%	5%
Agreed	45%	42%	38%	38%	43%	11%	10%
Don't Know	0%	0%	6%	6%	10%	1%	15%
Not Agreed	10%	53%	22%	22%	5%	21%	55%
Not agreed at all	0%	0%	9%	9%	5%	24%	15%

A clear majority of the Afghanistan respondents *agreed* (45%) or *fully agreed* (45%) that a lot of food waste is down to cooking or preparing too much diet whereas 10% *disagreed* with this. In Benin, a short majority of the respondents (53%) disagreed that a lot of food waste is down to cooking or preparing too much diet, while 42% *agreed* and 5% *fully agreed*. Although a vast majority of the Cameroonian respondents (64%) agreed that a lot of food waste is down to cooking or preparing too much diet, 22% disagreed and 9% fully disagreed with this statement.

In Saudi Arabia, most the respondents (62%) agreed that a Lot of Food Waste is Down to Cooking or Preparing Too Much Diet, though 30% do not know and 9% disagree with this statement. A clear majority of the respondents (81%) agreed or fully agreed that a lot of food waste is down to cooking or preparing too much diet, while a small minority agreed or didn't agree at all. In Turkey, more than half of the surveyed business places (55%) think that a lot of food waste is due to cooking or preparing too much diet. In contrast, 45% did not have the same idea.

In Uzbekistan, a strong majority of the respondents *disagreed* or *did not agreed at all* that a lot of food waste is down to cooking or preparing too much diet. They were only 15% to agree or fully agree with this.

Table 108: Agreement with the statement "A lot of food waste is down to store promotions and different offers"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	15%	0%	7%	25%	24%	29%	15%
Agreed	70%	37%	39%	38%	75%	15%	10%
Don't Know	10%	26%	17%	6%	24%	4%	40%
Not Agreed	5%	37%	26%	22%	5%	42%	30%
Not agreed at all	0%	0%	11%	9%	0%	10%	5%

Afghanistan respondents agreed in the clear majority (85%) with the statement according to which a lot of food waste is down to store promotions and different offers. Only 5% disagreed while 10% didn't know. In Benin, there is a same share of the food business respondents that *agreed* (37%) as those who *disagreed* (37%) with the statement "A lot of food waste is down to store promotions and different offers". A big share of them also didn't know what to answer (26%), so the respondents were quite divided. Of all Cameroonian business entities, 39% agreed with the statement according to which a lot of food waste is down to store promotions and different offers and 7% fully agreed. There is, however a big minority that disagreed (26%) or fully disagreed (11% with it and a high rate of people who didn't know what to answer (17%).

In Saudi Arabia, 70% did not know what to think about the statement according to which a lot of food waste is down to store promotions and different offers. 20% agreed with it while 10% disagreed. In Senegal, there is a vast majority of the food business respondents that *agreed* (75%) or *fully disagreed* (24%) with the statement according to which a lot of food waste is down to store promotions and different offers". A high share of them also didn't know what to answer (24%) while only 5% *disagreed* with this statement. Of all Turkish business entities, 44% believed that a lot of food waste is down to store promotions and different offers. However, more respondents (52%) did not agree with that.

Uzbekistan respondents to this survey were quite divided as for the statement according to which a lot of food waste is down to store promotions and different offers. 40% didn't know what to answer. And while 25% *agreed* or *fully agreed*, 35% *disagreed* or *completely disagreed*.

Table 109: Agreement with the statement "A lot of food waste is down to the kids"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	0%	0%	24%	46%	29%	15%	45%
Agreed	45%	16%	25%	45%	33%	22%	20%
Don't Know	20%	21%	14%	4%	29%	2%	10%
Not Agreed	35%	63%	32%	3%	10%	56%	25%
Not agreed at all	0%	0%	5%	2%	0%	5%	0%

Afghanistan food businesses were quite divided as for stating if a lot of food waste is due to the kids. 45% agreed but 35% disagreed while 20% didn't know. Most the food business places surveyed (63%) don't think that a lot of food waste is due to the kids in Benin. In Cameroon,

49% of the commercial places believe that a lot of food waste is due to the kids, whereas 37% do not think so. 13,73% didn't have any opinion.

Almost all the hospitality places (90%) believe that a lot of food waste is due to the kids in Saudi Arabia, whereas 5% do not think so. Most the food business places surveyed (62%) *agreed* or *fully agreed* that a lot of food waste is due to the kids in Senegal. A high rate of them didn't know (29%) whereas only 10% disagreed. Table 75 indicates that 37% of the Turkish food business places agreed with that a lot of food waste is due to the kids, whereas 61% did not agree with this premise. Many the food business places surveyed (65%) *agreed* or *fully agreed* that a lot of food waste is due to the kids in Uzbekistan. They were 25% to disagree with this idea.

Table 110: Agreement with the statement "If I make a better menu planning, I can minimize food waste"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	20%	5%	25%	32%	43%	37%	50%
Agreed	45%	79%	46%	60%	19%	16%	20%
Don't Know	15%	5%	17%	2%	29%	3%	10%
Not Agreed	20%	11%	10%	3%	0%	34%	10%
Not agreed at all	0%	0%	2%	2%	0%	10%	10%

In Afghanistan, a strong majority of the hospitality places that were surveyed *agreed* (45%) or *fully agreed* (20%) that if they better planned their menu they could minimize their food wastage. They were 20% to disagree while 15% didn't know what to answer. A strong majority of Beninese food business respondents *agreed* (79%) or *fully agreed* (5%) that they can minimize food waste if they make a better menu planning. Only 11% *disagreed* with this statement. In Cameroon, most of the food business respondents agreed (46%) or fully agreed (25%) that they can minimize food waste if they make a better menu planning. 17% didn't know what to think about this statement.

In Saudi Arabia, 92% of all respondent business entities thought that they can minimize food waste if they make a better menu planning. Only 5% disagreed with this opinion. 43% of the hospitality places surveyed in Senegal *fully agreed* that if they better plan their menu, the can minimize food waste. 19% *agreed*, also. They were only 10% to *disagree* while 29% of the respondents *did not know*. 53% of the Turkish business entities thought that they can minimize food waste if they make a better menu planning. On the other hand, 44% disagreed with this opinion.

A strong majority of the Uzbekistan hospitality places that were surveyed *agreed* and *fully agreed* that if they better planned their menu they could minimize their food wastage (70%). The rest of the respondents were shared between the other propositions (10% each) and 20% disagreed in total.

Table 111: Agreement with the statement "Open buffet type of services creates high volume of food waste"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	90%	32%	25%	34%	24%	78%	35%
Agreed	10%	53%	35%	60%	10%	6%	12%
Don't Know	0%	16%	25%	1%	43%	0%	18%
Not Agreed	0%	0%	13%	3%	14%	12%	18%
Not agreed at all	0%	0%	3%	2%	10%	4%	18%

Table 77 indicates that all the Afghanistan food business participants agree that open buffet type of services create high volume of food waste. In Benin, 53% agreed with that open buffet type services created high volume of food waste and that 32% *fully agreed*. Nobody disagreed with this statement. In Cameroon, 35% agreed with that open buffet type services created high volume of food waste. It is interesting to note that, if 25% of them fully agreed with this statement, the same rate didn't know what to answer. In total, 16% disagreed with this statement. 93% of the Saudi food business places agreed with that open buffet type services created high volume of food waste, when only 5% did not agree with this premise.

In Senegal, a very high percentage of the surveyed food hospitality places did not know how to position vis-à-vis the statement according to which open-buffet type of services create high volumes of food waste. They were 24% to *fully agreed* and 10% to *agree* with this whereas they were 14% to *disagree* and 10% *not to agree at all*. In Turkey, 84% agreed with that open buffet type services created high volume of food waste, whereas 16% did not agree with this premise.

In Uzbekistan, the participants were also very divided on the question they were asked. There is no major position that emerges. The trend is that there are more hospitality food places that think that open buffet type of services creates high volume of food waste (47%) than those who think that it is not the case (35%).

Table 112: Agreement with the statement "I believe it would be useful if I get some training or briefing on how to minimize and manage food waste"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	70%	16%	52%	26%	19%	96%	35%
Agreed	30%	74%	24%	71%	57%	3%	30%
Don't Know	0%	0%	14%	0%	19%	0%	15%
Not Agreed	0%	11%	6%	0%	5%	1%	5%
Not agreed at all	0%	0%	5%	2%	0%	0%	15%

All the Afghanistan hospitality places also believe that they could minimize and better manage their food waste if they got a training or a briefing. A clear majority of the Beninese business places (89%) believed that it would be useful if they get some training or briefing on how to minimize and manage food waste. Only 11% don't think such trainings would be useful. A vast

majority of the Cameroonian business places (75%) believed that it would be useful if they get some training or briefing on how to minimize and manage food waste. Once again, there is a higher rate of respondents that didn't know what to think about it (14%) than respondents who disagreed (11%).

In Saudi Arabia, almost all surveyed business places (98%) believed that it would be useful if they get some training or briefing on how to minimize and manage food waste. More than three quarters of the Senegalese business places (76%) believed that it would be useful if they get some training or briefing on how to minimize and manage food waste. In Turkey, almost all surveyed business places (99%) believed that it would be useful if they get some training or briefing on how to minimize and manage food waste. In Uzbekistan, a majority (65%) of food business believe that it would be useful if they could get some training or briefing on how to minimize and manage food waste whereas a fifth of them don't think so.

Table 113: Agreement with the statement "It would be very useful if local authorities organize a food waste collection from catering / hospitality places"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	70%	68%	34%	29%	14%	91%	40%
Agreed	30%	32%	41%	68%	48%	4%	30%
Don't Know	0%	0%	13%	1%	29%	0%	25%
Not Agreed	0%	0%	9%	1%	10%	5%	5%
Not agreed at all	0%	0%	3%	1%	0%	0%	0%

The hospitality places surveyed in Afghanistan all agreed that it would be very useful if local authorities organized a food waste collection from catering/hospitality places. All the hospitality places surveyed in Benin *agreed* (32%) or *fully agreed* (68%) that it would be very useful if local authorities organize a food waste collection from catering/hospitality places.

Clear majority of the Cameroonian respondent business entities (75%) agreed that it would be very useful if local authorities organize a food waste collection from catering/hospitality places. Only 12% did not agree with this opinion while 13% didn't know what to answer. In Saudi Arabia, a clear majority of all respondent business entities (95%) agreed that it would be very useful if local authorities organize a food waste collection from catering/hospitality places. Only 2% did not agree with this opinion

Of all the hospitality places surveyed in Senegal 48% *agreed* and 14% *fully agreed* that it would be very useful if local authorities organize a food waste collection from catering/hospitality places. The form most respondents (62%). 29% didn't know what to answer. They form a high rate than those who disagreed with this statement (10%). In Turkey, a vast majority of all respondent business entities (95%) agreed that it would be very useful if local authorities organize a food waste collection from catering/hospitality places. Only 5% did not agree with this opinion.

The hospitality places surveyed in Uzbekistan agreed in majority that it would be very useful if local authorities organized a food waste collection from catering/hospitality places (70%) whereas they were only 5% to disagree. A quarter of the respondents didn't know what to answer to this statement.

Table 114: Agreement with the statement "The main reason for wood waste is the behavior of customers"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	65%	37%	25%	34%	24%	80%	25%
Agreed	35%	63%	42%	65%	48%	10%	30%
Don't Know	0%	0%	17%	1%	14%	3%	5%
Not Agreed	0%	0%	7%	0%	14%	6%	30%
Not agreed at all	0%	0%	10%	0%	0%	1%	10%

Table 80 indicates Afghanistan food business are divided on the question. Indeed, for short most them (55%) the main reason for wood waste is the behavior of customers, 40% disagreed or did not agree at all with this. In Benin, all the respondent business places thought that the behavior of the customers is the main reason for food waste.

In Cameroon, two-third (67%) of the respondent business places thought that the behavior of the customers is the main reason for food waste. 7% disagreed and 10% fully disagreed while 17% did not know what to think about it. In Saudi Arabia, almost all respondent business places (99%) thought that the behavior of the customers is the main reason for food waste. None of them disagreed with this. In Senegal, 71% of the respondent business places thought that the behavior of the customers is the main reason for food waste, whereas 14% didn't know and 14% did not agree.

In Turkey, 90% of all respondent business places thought that the behavior of the customers is the main reason for food waste. Uzbekistan food business are divided on the question. Indeed, for short most them (55%) the main reason for wood waste is the behavior of customers, 40% disagreed or did not agree at all with this.

Table 115: Agreement with the statement "A national campaign on food waste would be useful"

Agreement	Afghanistan	Benin	Cameroon	Saudi Arabia	Senegal	Turkey	Uzbekistan
Fully Agreed	100%	37%	34%	24%	48%	96%	50%
Agreed	0%	53%	46%	74%	29%	3%	15%
Don't Know	0%	5%	13%	1%	10%	1%	25%
Not Agreed	0%	5%	4%	0%	10%	0%	5%
Not agreed at all	0%	0%	4%	0%	5%	0%	5%

The hospitality places that were surveyed in Afghanistan *agreed* (15%) or *fully agreed* (50%) in majority that a national campaign on food waste would be useful, whereas only 10% *disagreed*

or *did not agree at all*. A high rate of the hospitality sector surveyed in Benin *agreed* (53%) or *fully agreed* (37%) that a national campaign on food waste would be useful, whereas 5,26% of them *disagreed*, only. Two-thirds (67%) of the Cameroonian respondent business places thought that the behavior of the customers is the main reason for food waste. 6,86% disagreed and 10% fully disagreed while 17% did not know what to think about it.

In Saudi Arabia, almost all business places that were surveyed (9%) also agreed that a national campaign on food waste would be useful. A strong majority of the hospitality sector surveyed in Senegal *agreed* (29%) or *fully agreed* (48%) that a national campaign on food waste would be useful, whereas 10% of them *disagreed* and 5% *did not agree at all*.

In Turkey, almost all business places that were surveyed (99%) agreed that a national campaign on food waste would be useful. The hospitality places that were surveyed in Uzbekistan *agreed* (15%) or *fully agreed* (50%) in majority that a national campaign on food waste would be useful, whereas only 10% *disagreed* or *did not agree at all*.

3. SUMMARY OF THE FINDINGS

3.1 Households

Profile of the households

a) Afghanistan

- Surveyed households in Afghanistan are composed of 10 members in average;
- Fathers do food shopping usually;
- Preferred shopping places are bazaars;
- Most of the households check their food stocks at home before going to buy food only sometimes;
- The respondents also never plan the meals for the days ahead;
- A majority do not make a shopping list before going to purchase food;
- Many the participants almost never order any takeaway or go to eat outside;
- Almost all the Afghanistan households very rarely eat frozen or convenience food.

b) Benin

- Surveyed households in Benin are composed of 5,2 members in average;
- Mothers do food shopping usually;
- Preferred shopping places are bazaars;
- All the households check their food stocks at home before going to buy food;
- Meals are generally planned for the days ahead at least sometimes;
- In general, they make a shopping list at least sometimes;
- Most of the respondents rarely or never order any takeaway or go to eat outside;
- Most of the Beninese households always eat frozen or convenience food;
- Most of them cooks more than one type of meal at least three days in the week.

c) Cameroon

- Surveyed households in Cameroon are composed of 8 members in average;
- Mothers do food shopping usually;
- Preferred shopping places are bio product market places and street sellers;
- A strong majority of the households check their food stocks at home before going to shopping;
- Most of the time, meals are planned for the days ahead;
- Almost all of them makes a shopping list at least sometimes;
- Most respondents rarely or never order any takeaway or go to eat outside;
- Half of the Cameroonian households often eat frozen or convenience food;
- Most of them cooks more than one type of meal at least two days in the week.

d) Saudi Arabia

- Surveyed households in Saudi Arabia are composed of 4 or 5 members in average;
- Mainly fathers do the shopping;
- Supermarkets are preferred as shopping place;
- Just over the half of the households check their food stocks at home before going to shopping;
- Most of the time, meals are planned for the days ahead;
- Almost all of them makes a shopping list at least sometimes;
- In general, Saudi Arabian households prefer homemade cooking than eating outside;
- Prefer to prepare a meal from scratch but also eat frozen or convenience food at least sometimes;
- Most of them cooks more than one type of meal one or two days in the week.

e) Senegal

- Surveyed households in Senegal are composed of 13 members in average;
- Mothers do food shopping usually;
- Preferred shopping places are streets sellers;
- A big half of the households generally check their food stocks at home before going to buy food;
- The respondents do not especially plan the meals for the days ahead;
- In general, they do not make a shopping list before going to purchase food;
- Many respondents rarely order any takeaway or go to eat outside;
- Most of the Senegalese households hardly eat frozen or convenience food;
- Almost none of them cook more than one type of meal more than three days in the week.

f) Turkey

- Surveyed households in Turkey are composed of 3 or 4 members in average;
- Mainly fathers do the shopping;
- Supermarkets are preferred as shopping place;
- Mostly food availability at home is checked before going to shopping;
- Most of the time, meals are planned a day ahead;
- Most of them makes a shopping list;
- In general, homemade cooking is preferred instead of restaurants;

- Does not prefer frozen or convenience food;
- Over half of them cooks more than one type of meal at least 4 days of the week.

g) Uzbekistan

- Surveyed households in Uzbekistan are composed of 4 members in average;
- Fathers do food shopping usually;
- Preferred shopping places are bazaars;
- Most of the households generally check their food stocks at home before going to buy food;
- The respondents sometimes plan the meals for the days ahead;
- A majority make a shopping list before going to purchase food;
- Many respondents rarely order any takeaway or go to eat outside;
- Most of the Uzbekistan households don't eat frozen or convenience food;
- A majority do not cook more than one type of meal more than two days in the week.

Households' ways of disposal

a) Afghanistan

- Mains reasons for getting rid of uneaten food are that they prefer to eat fresh daily cooked food, for health reasons and because old food does not taste good.
- Most of the Afghanistan households dispose the food that is not eaten to the nearest bin.
- All of them dispose food waste like tea bags, coffee granules and vegetable peelings to the nearest bin;
- Afghanistan households mainly dispose spoilt milk and other liquids to washbasin or outside;
- Fruits and vegetables, as well as bakery products, are the main over-purchased items that are thrown away;
- Most the households rarely or never dispose milk and other liquids;
- Over purchasing and not willing to consume leftover food are the main reason for throwing out the food;
- Most of Afghanistan participants are not bothered about throwing food away;
- They never watch TV broadcasts or read articles on food waste;
- A half of them finish their plate when they eat at home;
- Afghanistan households sometimes check the expiring date before purchasing a product;
- Most of Afghanistan households increase their food purchases in case of promotion;
- Most the households think that food waste is a problem even if it is biodegradable;
- A half of the household's respondents care about the amount of food they throw away, however most of them do not try to keep to the minimum;
- Most of them would probably end up throwing less if they had knowledge on how to best store food;
- Most the households that were surveyed care about food poisoning and therefore try to be careful about food storage;
- All of them think that cooking too much diet leads to food waste;
- Most of them think that a lot of food waste is down to the kids;
- Most of them think that super-sizing food contributes to leftover food;

- Most the Afghanistan households think that some of the solutions they were introduced could contribute to reduce food waste (taking back home the food leftovers, encouraging restaurants to sell half portions, using smaller buffets or taking back home the food leftovers).

b) Benin

- Mains reasons for getting rid of uneaten food are health reasons and to avoid food poisoning;
- Beninese mainly dispose the food that is not eaten in the nearest bin (including tea bags, coffee granules and vegetable peelings) or they give it to animals;
- Beninese households dispose spoilt milk and other liquids outside or to washbasin;
- Fruits and vegetables are the main over-purchased items that are thrown away;
- Beninese households very rarely dispose milk and other liquids;
- Expiration date and the problem with the taste are the main reason for throwing out the food;
- All the participants are bothered of throwing food away;
- All of them finish their plate when they eat at home, at least often;
- Many the households check the expiring date before purchasing a product;
- Beninese households are not impact that much by promotions when they go purchasing food;
- Many Beninese respondents don't know if discarded food is a greater environmental concern than food waste, even if there are more agreements than disagreements with this statement;
- Most them think that food waste is not a problem as it is biodegradable
- Beninese are quite divided about the fact of caring about the amount of food waste that I throw away, however all of them try to keep it at the minimum;
- A clear majority of them think that if they had a better knowledge on how to store food, to better do food shopping as well as of the environmental impact of food waste, then they would throw less food away;
- All the Beninese households are careful about food poisoning so about food storage;
- They are quite divided about some statements according to which cooking too much diet, or food promotions, lead to food waste;
- Most them feel embarrassed to ask for taking back home their food leftovers from the restaurant, thinks that food businesses refuse them to take back their leftovers and that super-sizing food leads to food waste and that the way of offering the meal has an impact on leftover food;
- All the people surveyed agree with some solutions that they were introduced to reduce food waste, such as tacking leftovers back home, using smaller buffets in restaurants or reducing the portions in the restaurants;
- All of them also state to be aware of the amount of money that is thrown away when leftovers are thrown away.

c) Cameroon

- Cameroonian people are quite divided with regards to the reasons of disposing uneaten food, however health reasons and avoiding food poisoning are the most common ones;
- Cameroonians mainly dispose the food that is not eaten in the nearest bin;

- Concerning the way to dispose spoilt milk and other liquids, Cameroonians are sharply divided;
- Fruits and vegetables are the main over-purchased items that are thrown away;
- Cameroonians very rarely dispose milk and other liquids;
- Expiration date is the main reason for throwing out the food;
- A good half of the participants are quite bothered of throwing food away;
- Very few are those who do not finish their plate at home;
- Most of them finish their plate when they eat at home
- Most of them check the expiring date before purchasing a product;
- Cameroonian are sharply divided as for the impact of food promotion on their shopping habits;
- Cameroonian participants are quite divided as for caring about the food waste that they throw away, however most of them think it is not a problem as it is biodegradable;
- However, in the same time, most of them try to keep the food thrown away to the minimum;
- A clear majority of them think that if they had a better knowledge on how to store food, to better do food shopping, of the environmental impact of food waste, then they would throw less food away;
- For most of them, throwing food away is due to cooking too much and that the way of offering food has an impact on the leftovers;
- A big share of them agree with some solutions that they were introduced to reduce food waste, such as tacking leftovers back home, using smaller buffets in restaurants or reducing the portions in the restaurants;
- Most of them state to be aware of the amount of money thrown away with throwing away leftovers.

d) Saudi Arabia

- Saudi Arabian are rather divided concerning the way of disposing the food that is not eaten, however almost all of them dispose the vegetable peelings, coffee granules and tea bags to a normal bin
- Clear majority dispose the liquid waste (milk, juice and etc) to washbasin
- Bakery products are the main over-purchased items
- Saudi Arabian very rarely dispose milk and other liquids;
- Expiration date and over-purchasing are the main reasons for throwing out the food
- Most of the participants read or watch food waste related topics at least sometimes and a big half are concerned about the food throwing
- Saudi Arabian are very careful before opening a new package of food
- Most of them finish their plate when they eat at home
- Food promotions have a certain impact on over-purchasing
- Saudi Arabian are sharply divided on the problematic of food waste and on the necessity to be careful of the food that is thrown away
- However, almost all of them state that they try to waste the minimum possible and that they would like to make additional efforts to reduce it again if they had a more general knowledge about the causes and consequences of food waste
- Almost all of them, though, declare to be aware of some of the causes of food waste, like preparing to much diet, promotions in the stores, behavior of the kids, supersize of the food or the way of offering the meal.

- Most of the participants a really embarrassed about taking the leftover food from the restaurants to home and a half of them state that restaurants do not authorize them to do so
- Almost all of them also agree on the solutions they were introduced to reduce food waste, like reducing the portions, taking back home the leftovers, using smaller buffets,
- Almost all of them are aware of the amount of money that is lost when food is wasted too.

e) Senegal

- Mains reasons for getting rid of uneaten food are health reasons and to keep the fridge clean;
- Senegalese mainly give the food that is not eaten to animals or to poor people. However, they state to dispose food waste like tea bags, coffee granules and vegetable peelings to special recycling center or by throwing them to septic system;
- Senegalese households mainly dispose spoilt milk and other liquids by taking them to collection sites;
- Meat, fish and chicken products are the main over-purchased items that are thrown away;
- Senegalese households very rarely dispose milk and other liquids;
- Space problems and over stocking are the main reason for throwing out the food;
- Senegalese participants are quite divided as for the extent that throwing out food bothers, however a majority is very bothered by this;
- They are once again quite divided as for the frequency of finishing their plate when they eat at home;
- Senegalese households generally check the expiring date before purchasing a product;
- Senegalese households generally did not report to be impacted by promotions when they go purchasing food;
- Senegalese respondents think that discarded food is a greater environmental concern than food waste;
- A short majority thinks that food waste is not a problem as it is biodegradable;
- Senegalese respondents are rather divided regarding the fact of caring with the amount of food they throw away, however a majority reports to try to keep it at the minimum;
- A clear majority of them think that if they had a better knowledge on how to store food and to better do food shopping, then they would throw less food away; however, they don't think that if they would throw less away if they had a better knowledge of the environmental impact of the food waste;
- Senegalese households are quite divided as for caring about food poisoning and food storage because of it;
- They are quite divided about the statements according to which cooking too much diet leads to food waste
- A majority believe that a lot of food waste is down to store promotions;
- Most of them feel embarrassed to ask for taking back home their food leftovers from the restaurant and think that food businesses refuse them to take back their leftovers;
- A high rate of the Senegalese surveyed do not know what to think about some solutions that they were introduced to reduce food waste, such as encouraging restaurants to sell half portions or using smaller buffets;

- A half of them state to be aware of the amount of money that is thrown away when leftovers are thrown away.

f) Turkey

- Clear majority dispose the food waste (including vegetable peelings and tea bags) to the nearest bin
- Vast majority dispose the Liquid waste (milk, juice and etc) to washbasin
- Fruit, vegetables and bakery products are the main overbuy items
- In general milk and other liquids are not disposed (mainly consumed)
- Expiration date is the main reason for throwing out the food
- Most of the participants do not read or watch food waste related topics. However, most of them are concerned about the food throwing
- Food promotions have an impact on overbuy
- Most of the participant are aware that wasting food is a problem but at the same time they don't know the impacts on environment
- Around half of the participants would like to learn the better ways of storing food and shopping to avoid throwing
- Reasonable percent of the participants believe that kids are important reason for food throwing
- Most of the participants do not worry about taking the leftover food to home
- Most of them believes that type of offering the food (at restaurants) is a reason for food wasting, such as large buffets. Therefore, half portion possibility in restaurants may avoid food waste.

g) Uzbekistan

- Mains reasons for getting rid of uneaten food are health reasons and to avoid food poisoning;
- Uzbekistan households generally give the food that is not eaten to animals or dispose it to the nearest bin.
- Almost all of them dispose food waste like tea bags, coffee granules and vegetable peelings to the nearest bin;
- They mainly dispose spoilt milk and other liquids by taking them to collection sites or making cottage cheese;
- Fruits and vegetables are the main over-purchased items that are thrown away;
- Most the households rarely or never dispose milk and other liquids;
- Expiration date and over stocking are the main reason for throwing out the food;
- Most Uzbekistan participants are bothered about throwing food away;
- Most of them finish their plate when they eat at home;
- Most of the Uzbekistan households check the expiring date before purchasing a product;
- Uzbekistan households are divided on the impact of food promotions on their shopping behavior;
- Most of the Uzbekistan respondents think that discarded food is a greater environmental concern than food waste;
- A half of the households thinks that food waste is not a problem as it is biodegradable;
- A short majority of Uzbekistan respondents care about the amount of food they throw away, however almost all of them reports to try to keep it at the minimum;

- A vast majority of them think that if they had a better knowledge on how to store food, on how to better do food shopping and on the environmental impact of food waste, they would throw less food away;
- All the households that were surveyed care about food poisoning and therefore try to be careful about food storage;
- They are quite divided about the statements according to which cooking too much diet as well as store promotions lead to food waste;
- A clear majority of them think that a lot of food waste is down to the kids;
- Uzbekistan households are rather divided as for the question of taking back home their food leftovers from the restaurant as well as on the eventuality of being refused to take back their leftovers by the food businesses;
- A majority thinks that super-sizing food as well as the way of offering the food are a trend contributing to leftover food;
- Most the Uzbekistan households think that some of the solutions they were introduced could contribute to reduce food waste (encouraging restaurants to sell half portions, using smaller buffets or taking back home the food leftovers);
- Almost all of them state to be aware of the amount of money that is thrown away when leftovers are thrown away.

Amount of food waste produced in Household

a) Afghanistan

- *Dairy Products*: Average of 7200 grams / week during the preparation step, 7850 grams during the service and 0 grams of plate-waste / week was reported by households.
- *Meat/Eggs/Legumes:* Average of 4650 grams / week during the preparation step, 4430 grams during the service and 0,59 grams of plate-waste / week was reported by households.
- *Fruits and Vegetables*: Average of 13850 grams / week during the preparation step, 12475 grams during the service and 2,22grams of plate-waste / week was reported by households.
- *Bread and Cereals*: Average of 18450 grams / week during the preparation step, 15875 grams during the service and 10 grams of plate-waste / week was reported by households.
- Sugar and Sweets: Average of 1955 grams / week during the preparation step, 1815 grams during the service and 0 grams of plate-waste / week was reported by households.

b) Benin

- *Dairy Products*: Average of 85,50 grams / week during the preparation step, 20,05 grams during the service and 20,05 grams of plate-waste / week was reported by households.
- *Meat/Eggs/Legumes:* Average of 238,4 grams / week during the preparation step, 50,75 grams during the service and 65,25 grams of plate-waste / week was reported by households.
- *Fruits and Vegetables*: Average of 189,65 grams / week during the preparation step, 53,90 grams during the service and 54,85 grams of plate-waste / week was reported by households.

- *Bread and Cereals*: Average of 23,05 grams / week during the preparation step, 11,75 grams during the service and 3,75 grams of plate-waste / week was reported by households.
- Sugar and Sweets: Average of 46 grams / week during the preparation step, 25,35 grams during the service and 19 grams of plate-waste / week was reported by households.

c) Cameroon

- *Dairy Products*: Average of 118 grams / week during the preparation step, 122 grams during the service and 117 grams of plate-waste / week was reported by households.
- *Meat/Eggs/Legumes:* Average of 112 grams / week during the preparation step, 96 grams during the service and 94 grams of plate-waste / week was reported by households.
- *Fruits and Vegetables*: Average of 280 grams / week during the preparation step, 175 grams during the service and 146 grams of plate-waste / week was reported by households.
- *Bread and Cereals*: Average of 184 grams / week during the preparation step, 169 grams during the service and 98 grams of plate-waste / week was reported by households.
- Sugar and Sweets: Average of 172 grams / week during the preparation step, 109 grams during the service and 66 grams of plate-waste / week was reported by households.

d) Saudi Arabia

- *Dairy Products*: Average of 810 grams / week during the preparation step, 787 grams during the service and 266 grams of plate-waste / week was reported by households.
- *Meat/Eggs/Legumes:* Average of 1.491 grams / week during the preparation step, 1.359 grams during the service and 423 grams of plate-waste / week was reported by households.
- *Fruits and Vegetables*: Average of 1612 grams / week during the preparation step, 1775 grams during the service and 573 grams of plate-waste / week was reported by households.
- *Bread and Cereals*: Average of 1532 grams / week during the preparation step, 1342 grams during the service and 419 grams of plate-waste / week was reported by households.
- Sugar and Sweets: Average of 642 grams / week during the preparation step, 656 grams during the service and 82 grams of plate-waste / week was reported by households.

e) Senegal

- *Dairy Products*: Average of 2558,25 grams / week during the preparation step, 2506,75 grams during the service and 416 grams of plate-waste / week was reported by households.
- *Meat/Eggs/Legumes:* Average of 3172,95 grams / week during the preparation step, 3096 grams during the service and 965 grams of plate-waste / week was reported by households.

- *Fruits and Vegetables*: Average of 2233,75 grams / week during the preparation step, 2189,65 grams during the service and 359,25 grams of plate-waste / week was reported by households.
- *Bread and Cereals*: Average of 1733,5 grams / week during the preparation step, 1716,1 grams during the service and 306,15 grams of plate-waste / week was reported by households.
- Sugar and Sweets: Average of 1304,95 grams / week during the preparation step, 1290,1 grams during the service and 176,25 grams of plate-waste / week was reported by households.

f) Turkey

- *Dairy Products*: Average of 3,742 grams / week during the preparation step, 3,671 grams during the service and 69 grams of plate-waste / week was reported by households.
- *Meat/Eggs/Legumes:* Average of 2,615 grams / week during the preparation step, 2,538 grams during the service and 49 grams of plate-waste / week was reported by households.
- *Fruits and Vegetables*: Average 5,428 grams / week during the preparation step, 5,146 grams during the service and 80 grams of plate-waste / week was reported by households.
- *Bread and Cereals*: Average of 2,164 grams / week during the preparation step, 2,035 grams during the service and 54 grams of plate-waste / week was reported by households.
- Sugar and Sweets: Average of 1,111 grams / week during the preparation step, 1,103 grams during the service and 11 grams of plate-waste / week was reported by households.

g) Uzbekistan

- *Dairy Products*: Average of 2558,25 grams / week during the preparation step, 2742,35 grams during the service and 83,33 grams of plate-waste / week was reported by households.
- *Meat/Eggs/Legumes:* Average of 3735,29 grams / week during the preparation step, 3355,88 grams during the service and 14,29 grams of plate-waste / week was reported by households.
- *Fruits and Vegetables*: Average of 7411,76 grams / week during the preparation step, 6823,62 grams during the service and 115,38 grams of plate-waste / week was reported by households.
- *Bread and Cereals*: Average of 5330,55 grams / week during the preparation step, 4628,94 grams during the service and 373,33 grams of plate-waste / week was reported by households.
- Sugar and Sweets: Average of 1861,11 grams / week during the preparation step, 1647,22 grams during the service and 117,64 grams of plate-waste / week was reported by households.

Hospitality sector

a) Afghanistan

- All the food business places (restaurant, bars, pubs, coffees) are opened every day;
- Almost none of the hospitality places state that they have their own food waste collection system;
- Average reported waste per entity per day
  - An average of 1,80 kg of meat/chicken/fish
  - Average of 1,76 kg of vegetable and salad
  - Average of 1,23 kg of cereals and bakery products
  - Average and 2,70 liters of fizzy juice
- Main reason of their food waste is related to the clients' leftovers and over orders from the part of the clients;
- All the Afghanistan food businesses answered that they dispose their solid food waste to the nearest bin;
- Most of them take their liquid food waste to washbasin;
- All of them throw tea bags, coffee granules and vegetable peelings to the nearest bin
- Most of them think that that less than 15% of their customers take their leftovers back home;
- Most of them thinks that food waste is a problem even if it is natural and biodegradable;
- Most of the Afghanistan food businesses do not care about the amount of food waste that they throw away and almost all of them do not try to keep it to the minimum;
- Most of them care about food poisoning and therefore try to be careful about food storage
- Most of them also do not believe managing food waste is part of their job;
- Almost all of them think that preparing too much diet, as well as promotions on foodstuffs in the stores lead to food waste;
- All the hospitality places believe that to minimize food waste trainings, a national campaign and food waste collection lead by the authorities would be useful;

b) Benin

- Almost all the places (restaurant, bars, pubs, coffees) are opened at least 6 days;
- Most the hospitality places state that they don't have their own food waste collection system and none of those who don't have such system plan to have one;
- Average reported waste per entity per day
  - An average of 4,98 kg of meat/chicken/fish
  - Average of 1,97 kg of vegetable and salad
  - Average of 1,47 kg of fruits
  - Average of 0,39 kg of cereals and bakery products
  - Average of 0,28 kg of sweet
  - Average of 0,45 liters of fruits juice
  - Average of 0,35 liters of milk
  - Average of 0,0526 liters of yoghurt
  - Average and 0,56 liters of fizzy juice
- Main reason of their food waste is related to the clients' leftovers;

- A clear majority of the food businesses answered that they dispose their solid food waste to the nearest bin and that their liquid food waste to the washbasin or outside;
- Almost all of them of them state that less than 15% of their clients take back their food leftovers;
- Many them agree that discarded food packaging is a greater environmental concern than food waste and a similar majority disagreed that food waste is not a problem because it is natural and biodegradable;
- Beninese food businesses care about the amount of food waste that they throw away and most of them try to keep it to the minimum;
- Almost all the respondents stated that they could reduce their food waste if they knew how to best store food, how to better do food shopping and if they knew about the environmental impact of food waste;
- A strong majority also believe managing food waste is part of their job;
- Hospitality places are quite divided with the statements according to which preparing too much diet or food promotion in stores lead to food waste. But most them think don't believe that food waste is due to the kids;
- Most of the hospitality places believe that to minimize food waste trainings, a national campaign and food waste collection lead by the authorities would be useful.

c) Cameroon

- Almost all the places (restaurant, bars, pubs, coffees) are opened at least 6 days;
- Most of them state that they have their own food waste collection system but most of them dispose solid food waste to the nearest bin;
- Average reported waste per entity per day
    - An average of 1,5 meat/chicken/fish
    - Average of 1,5 vegetable and salad
    - Average of 1,14 fruits
    - Average of 1,29 cereals and bakery products
    - Average of 0,68 sweet
    - Average of 0,81 liters of fruits juice
    - Average of 0,52 liters of milk
    - Average of 0,37 liters of yoghurt
    - Average and 1,59 liters of fizzy juice
- Main reason of their food waste is related to the clients' leftovers;
- Most of them state that less than 15% of their clients take back their food leftovers;
- A half of them agree that discarded food packaging is a greater environmental concern than food waste and that food waste is not a problem because it is natural and biodegradable;
- Cameroonian food businesses are quite divided as for the importance they give to amount of food waste that they throw away but most of them try to keep it to the minimum;
- Most of them state that they could reduce their food waste if they knew how to best store food, how to better do food shopping and if they knew about the environmental impact of food waste;
- A majority also believe managing food waste in a useful way is part of their job;
- A half of these hospitality places believe food waste is down to preparing too much food but they don't especially think that store promotions, or even kids, have something to do with that;

Most of the hospitality places believe that to minimize food waste trainings, a national campaign and food waste collection lead by the authorities would be useful.

d) Saudi Arabia

- Almost all the places (restaurant, bars, pubs, coffees) are open everyday
- Almost of them have their own food waste collection system
- Average reported waste per entity per day
    - An average of 0,239 kg meat/chicken/fish
    - Average of 0,278 kg vegetable and salad
    - Average of 0,266 kg fruits
    - Average of 0,51 kg cereals and bakery products
    - Average of 0,127 kg sweet
    - Average of 0,204 liters of fruits juice
    - Average of 0.314 liters of milk
    - Average of 0,325 liters of yoghurt
    - Average and 0,064 liters of fizzy juice
- First reason of their food waste is the leftovers of the clients, followed by too big portions and then passed expiry date
- Saudi Arabian hospitality places are quite divided as to know the scale of their customers take back home their food leftovers but almost all of them agree that their customers' behavior is the main reason of food waste
- Almost all of them agree that discarded food packaging is a greater environmental concern than food waste but most of them do not know if food waste is a problem because of being natural and biodegradable
- Almost all of them care about the amount of food waste that they throw away. They state that they are trying to reduce it as much as possible and that they could reduce it again if they had a better knowledge of the causes and consequences, as well as on how to do it. Almost all of them also believe managing food waste in a useful way is part of their job
- Even though, many of these places agree on some of the causes of food waste, like preparing too much diet, open buffets or kids' behavior
- Also, most of them agree with the solutions they were introduced to reduce food waste, like better planning the menus
- Almost all the food businesses would also appreciate to receive trainings to minimize food waste, would participate to waste collection managed by the authorities and think that a national campaign on food waste would be useful
- Clear majority of them are concerned about food waste and throwing to the normal bin or washbasin. But they don't have good level of knowledge about the impacts of food waste for environment and request for training. At the same time, they request local authorities to provide food waste collection system.
- Around 37% of them reported that kids are an important reason for food waste
- Clear majority is agreed that open buffet services causes high volume of food waste
- Vast majority of them believes that a national campaign about food waste would be very useful.

e) Senegal

- Most of the places (restaurant, bars, pubs, coffees) are opened every day and none of them less than 6 days;
- Almost all the hospitality places state that they don't have their own food waste collection system;
- Average reported waste per entity per day
    - An average of 9,5 kg of meat/chicken/fish
    - Average of 8,25 kg of vegetable and salad
    - Average of 6,63 kg of fruits
    - Average of 7,15 kg of cereals and bakery products
    - Average of 4,95 kg of sweet
    - Average of 8,28 liters of fruits juice
    - Average of 6,44 liters of milk
    - Average of 4,97 liters of yoghurt
    - Average of 7 liters of fizzy juice
- Main reason of their food waste is related to the clients' leftovers and over orders from the part of the clients;
- Senegalese food businesses answered that they dispose their solid food waste by giving it to animals, to poor people or by donating it to charities;
- They donate their liquid food waste to charities or the take them to collection sites;
- They state to dispose food waste like tea bags, coffee granules and vegetable peelings to a special recycling center;
- Most of them state that less than 15% of their clients take back their food leftovers;
- Most of them agree that discarded food packaging is a greater environmental concern than food waste and that food waste is not a problem because it is natural and biodegradable;
- Most of the Senegalese food businesses care about the amount of food waste that they throw away and most of them try to keep it to the minimum;
- Most the respondents stated that they could reduce their food waste if they knew how to best store food, how to better do food shopping and if they knew about the environmental impact of food waste;
- Most of them also believe managing food waste is part of their job;
- Hospitality places agree with the statements according to which preparing too much diet and food promotion in stores lead to food waste, as well as the fact that a lot of food waste is due to the kids;
- Most of the hospitality places believe that to minimize food waste trainings, a national campaign and food waste collection lead by the authorities would be useful;
- Most of them report to be aware of the amount of money that they throw away with the leftovers.

f) Turkey

- Clear majority of the places (restaurant, bars, pubs, coffees) are open everyday
- Vast majority of them do not have their own food waste collection system and not planning to have in the future as well
- Average reported waste per entity per day
    - An average of 4.2 kg meat/chicken/fish
    - Average of 4.1 kg vegetable and fruit

  - Average of 1kg fruit
  - Average of 0.24 kg sweet
  - Average of 1.9 liters of juice and 1.7 liters of fizzy juice
  - Average of 2 kg bakery products
- Most participants give the waste to animals (probably street animals). Only 10% of them either donates food charities or dispose to special food waste collector
- Clear majority dispose the liquid waste to washbasin
- Main reason for left over is the over orders by the clients
- Clear majority throws the tea bags and coffee granules to normal bin
- Less than 15% of the clients take the leftover food to home
- Clear majority of them are concerned about food waste and throwing to the normal bin or washbasin. But they don't have good level of knowledge about the impacts of food waste for environment and request for training. At the same time, they request local authorities to provide food waste collection system.
- Around 37% of them reported that kids are an important reason for food waste
- Vast majority is agreed that open buffet services causes high volume of food waste
- Clear majority of them believes that a national campaign about food waste would be very useful.

g) Uzbekistan

- Most of the places (restaurant, bars, pubs, coffees) are opened every day;
- A short majority of the hospitality places state that they have their own food waste collection system;
- Average reported waste per entity per day
  - An average of 1,63 kg of meat/chicken/fish
  - Average of 2,58 kg of vegetable and salad
  - Average of 0,66 kg of fruits
  - Average of 1,23 kg of cereals and bakery products
  - Average of 0,11kg of sweet
  - Average of 1,11 liters of fruits juice
  - Average of 0,18 liters of milk
  - Average of 0 liters of yoghurt
  - Average and 2,42 liters of fizzy juice
- Main reason of their food waste is related to the clients' leftovers and over orders from the part of the clients;
- Most of the Uzbekistan food businesses answered that they dispose their solid food waste by giving it to animals;
- Most of them take their liquid food waste to collection sites;
- They throw tea bags, coffee granules and vegetable peelings to the nearest bin;
- A majority agrees that discarded food packaging is a greater environmental concern than food waste and a half thinks that food waste is not a problem because it is natural and biodegradable;
- Most of the Uzbekistan food businesses care about the amount of food waste that they throw away and almost all of them try to keep it to the minimum;
- Most the respondents stated that they could reduce their food waste if they knew how to best store food, how to better do food shopping and if they had a better knowledge about the environmental impact of food waste;
- Most of them also believe managing food waste is part of their job;

- Hospitality places disagree with the statements according to which preparing too much diet and food promotion but they agree with that a lot of food waste is down to the kids;
- Most of the hospitality places believe that to minimize food waste trainings, a national campaign and food waste collection lead by the authorities would be useful.