2020

NEAR EAST AND NORTH AFRICA
REGIONAL OVERVIEW OF FOOD SECURITY AND NUTRITION

ENHANCING RESILIENCE OF FOOD SYSTEMS IN THE ARAB STATES

This flagship publication is part of **Regional Overview of Food security and nutrition in the Near East and North Africa** series of the Food and Agriculture Organization of the United Nations.

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SYRIA. Syrian women visit the goat cheese producer farm.

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CONTENTS

TABLES, FIGURES AND BOXES

FOREWORD

The 2020 Regional Overview of Food Security and Nutrition in the Near East and North Africa (NENA) Region provides an update on regional progress towards two targets of Sustainable Development Goal 2 (SDG 2): Target 2.1, ending hunger and achieving food security; and Target 2.2, on ending all forms of malnutrition. It is the result of collaboration between the Food and Agriculture Organization of the United Nations (FAO), the Economic and Social Commission for Western Asia (ESCWA), the International Fund for Agricultural Development (IFAD), the United Nations International Children's Emergency Fund (UNICEF), the World Food Programme (WFP) and the World Health Organization (WHO).

This report examines data available prior to the Covid-19 pandemic that affected the region and the world in 2020. By 2019, the Arab Region was already off track to achieve hunger and nutrition-related SDG targets by 2030. In fact, after good progress during past decades, since 2015-17 the number of undernourished people in the region has been increasing steadily. In 2019, the number of hungry people stood at 51.4 million, or 12.2 percent of the region's population. If such trends continue, even ignoring the potential impact of Covid-19, the number of undernourished in the region will exceed 75 million people by 2030.

The report also highlights that in 2019 nearly one-third of the region's population,

137 million people, did not have regular access to sufficient, safe and nutritious food. Food insecurity, affecting diet quality and quantity, poses significant challenges to achieving global nutrition targets. Many countries in the region still show high levels of stunting and overweight in children under 5 years of age. Though there are insufficient data to establish clear childhood malnutrition indicators in all countries, 2019 trends indicated that only a few countries are likely to meet the SDG targets for 2030 on stunting (3 out of 22) and wasting (7 out of 22), while none are on track to fulfil the WHA (World Health Assembly) targets for 2025. Furthermore, no country in the region is on track to meet 2025 WHA targets for anaemia in women of reproductive age or adult obesity.

The above trends in hunger, food insecurity and malnutrition have largely been driven by conflict and violence in the region as well as the lack of capacity for current food systems to support healthy diets. Food security and nutrition prospects in the region are likely to worsen in view of the overwhelming economic disruptions caused by Covid-19, which has generated rising numbers of vulnerable people with limited access to healthy, balanced diets. Given the large disparities among Arab Region countries in terms of their economic and political situation, as well as resilience capacities, Covid-19 has had varied impacts on food security and nutrition. Countries with fragile economies and those in protracted crisis are the worst affected.

This report examines the vulnerability of Arab food systems to various shocks, natural or human-induced, aggravated by stresses which limit their resilience capacity and ability to deliver sustainable, healthy diets for all. As the analysis in this report suggests, more than half the region's population cannot afford a healthy diet. Diet quality has major implications not only for food security and nutrition, but also for human health and the environment. The report quantifies the hidden costs of unsustainable diets related to health and climate change. The analysis emphasizes important linkages of SDG 2 (Zero hunger) with SDG 3 (Good health and well-being) and SDG 13 (Climate action) and the need to take a broad view of goals and targets to minimize potential trade-offs and enhance potential synergies between them.

Ensuring everyone has access to a healthy diet requires sustainable, resilient food systems. To move towards more resilient food systems across the Arab Region, this report identifies a set of policy directions for adoption while considering inter-system linkages and local contexts. These policy directions aim to bolster different food system components, including food supply chains, the food environment as well as consumer knowledge and behaviour, while focusing on healthy diets and their affordability. We believe the policy recommendations in this joint report offer countries of the Arab Region avenues to strengthen the sustainability and resilience of their food systems and accelerate progress towards achieving the goals of the 2030 Agenda for Sustainable Development.

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ACRONYMS AND ABBREVIATIONS

AFED	Arab Forum for Environment and Development
CFS	Committee on World Food Security
DEC	dietary energy consumption
ESCWA	Economic and Social Commission for Western Asia
FAO	Food and Agriculture Organization of the United Nations
FAO RNE	FAO Regional Office for the Near East and North Africa
FAOSTAT	Food and Agriculture Organization Corporate Statistical Database
	Food and Agriculture Organization Corporate Statistical Database
FBDG	food-based dietary guidelines
FBS	food balance sheets
FIES	food insecurity experience scale
FPMA	food price monitoring and analysis
FSIN	Food Security Information Network
GCC	Gulf Cooperation Council
GDP	gross domestic product
GBV	gender-based violence
GHG	greenhouse gas

GIEWS	Global Information and Early Warning System
HLPE	High Level Panel of Experts on Food Security and Nutrition
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
Kcal	kilocalorie
LDC	least developed country
ICN2	Second International Conference on Nutrition
MENA	Middle East and North Africa
MtCO2-eq	metric tonnes of carbon dioxide equivalent
MDER	minimum dietary energy requirements
NCD	non-communicable disease
NENA	Near East and North Africa
OECD	Organisation for Economic Co-operation and Development
PoU	prevalence of undernourishment
PPPD	per person per day

ACRONYMS AND ABBREVIATIONS

RIMA	Resilience Index Measurement and Analysis	**UNOCHA**	United Nations Office for the Coordination of Humanitarian Affairs
RP	resilience principles	**UNSDG**	United Nations Sustainable Development Group
SDG	Sustainable Development Goal	**UNWTO**	United Nations World Trade Organization
SFS	sustainable food system	**USD**	United States dollar
SSR	self-sufficiency ratio	**WB**	World Bank
SBA	standby arrangement	**WDI**	World Development Indicators
UNDESA	United Nations Department of Economic and Social Affairs	**WEO**	World Economic Outlook
UNDP	United Nations Development Programme	**WFP**	World Food Programme
UNHCR	United Nations High Commissioner for Refugees	**WHA**	World Health Assembly
UNICEF	United Nations International Children's Emergency Fund	**WHO**	World Health Organization
UNIFEM	United Nations Development Fund for Women		

COUNTRY AND TERRITORY ABBREVIATIONS

A list of countries and territories with names abbreviated in the text

Algeria	People's Democratic Republic of Algeria	**Morocco**	Kingdom of Morocco
Bahrain	Kingdom of Bahrain	**Oman**	Sultanate of Oman
Comoros	Union of Comoros	**Qatar**	State of Qatar
Djibouti	Republic of Djibouti	**Palestine**	State of Palestine
Egypt	Arab Republic of Egypt	**Saudi Arabia**	Kingdom of Saudi Arabia
Iraq	Republic of Iraq	**Somalia**	Somali Republic
Jordan	Hashemite Kingdom of Jordan	**Sudan**	Republic of Sudan
Kuwait	State of Kuwait	**Syria**	Syrian Arab Republic
Lebanon	Lebanese Republic	**Tunisia**	Republic of Tunisia
Libya	State of Libya	**UAE**	United Arab Emirates
Mauritania	Islamic Republic of Mauritania	**Yemen**	Republic of Yemen

This year's report covers a total of 22 Arab States that include 19 NENA countries as well as three additional Arab States: Djibouti, Comoros and Somalia. Such coverage facilitates an analysis of the Arab States' group and is consistent with the League of Arab States' membership that includes 22 member states: Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Qatar, Palestine, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen.

KEY MESSAGES

➜ Since 2015–17 the number of people affected by hunger in the Arab Region continues to rise. The 2019 estimates show that before the Covid–19 pandemic 51.4 million people were hungry or 12.2 percent of the population – an increase of 1.1 million people from the previous period. The numbers affected by moderate or severe food insecurity also showed an upward trend with an estimated 137 million people in 2019 who do not have regular access to sufficient and nutritious food. The trend is mostly driven by an increase in moderate food insecurity.

➜ The NENA Region is not on track to reach the SDG target of Zero Hunger. If recent trends continue, the number of people affected by hunger will surpass 75 million by 2030. The impact of Covid–19 on the Region economy will further complicate the challenge of achieving the SDG 2.1 target to eliminate hunger.

➜ The burden of malnutrition in all its forms remains a challenge. Recent estimates for 2019 are that 22.5 percent of children under 5 years of age were stunted, 9.2 percent wasted and 9.9 percent were overweight. With 27 percent of the adult population obese, the Arab Region ranked second in the world for obesity. Estimated anaemia in women of reproductive age of 35 percent is a moderate public health issue in most countries of the region.

➜ Very few countries are on track to reach childhood nutrition targets by 2025 and 2030. For wasting, only seven countries are on track, while only three are on track for stunting or childhood overweight. No country in the region is on track to meet the WHA 2025 targets for anaemia in women of reproductive age (reducing it by half) or adult obesity (halt its rise).

➜ Conflict is the main factor behind the degrading hunger situation, but slow progress on nutrition SDG targets is also due to weaknesses in food systems across the region. Apart from conflict, the region's food systems are also affected by other shocks such as climate–related shocks, macroeconomic shocks (e.g. the food price crisis, fluctuating oil prices and tourism revenues) as well as health–related shocks, exemplified by the Covid–19 pandemic.

➜ A number of stresses like water scarcity, food import dependency, inequalities including the gender dimension, rapid population growth and migration, and shifting diets associated with the move from rural to urban settings exert negative pressures on food systems and increase their vulnerability. The lack of resilience in food systems exposed to various shocks and stresses multiplies the damage caused and negatively impacts on food security and nutrition.

➜ During the early stages of the Covid–19 pandemic, the resilience responses of the region's food systems to shocks were numerous and diverse and have in large part allowed food systems to continue functioning. But these responses were limited to the food supply chain, neglecting the overall food environment and individual level filters, consumer choice and diets. These represent a critical link between food security and nutrition outcomes of food systems.

➜ The affordability of healthy diet is a significant challenge given that it currently costs five times more than one that only meets dietary energy needs through a starchy staple. Healthy diets are unaffordable for more than 50 percent of the region's population, higher than the global average of 38 percent.

➜ All diets have hidden costs. While healthy diets are generally more expensive, their hidden health costs linked to NCDs (non–communicable diseases) as well as climate change costs linked to greenhouse gas (GHG) emissions are lower compared to current consumption patterns in the region. In fact, the full cost of current diets (USD 486 billion by 2030), accounting for hidden health and climate change costs, is 20 percent higher than that of healthy diets (USD 389.3 billion by 2030).

➜ According to estimates in this report, the adoption of healthy diets in the Arab Region including sustainability could lead to a 96 percent reduction in diet–related health costs according to current consumption and to 34–77 percent reduction in the diet–related social cost of GHG emissions in 2030. Thus, shifting to healthy diets will create significant savings that could be invested now to lower the cost of nutritious foods.

➜ Fixing resilience in a way that supports sustainable healthy food systems across the region is imperative to end hunger, achieve food security and improve nutrition. A careful analysis of complex intersystem linkages and their implications on food security and nutrition is critical to implement a range of policy actions to shock proof food systems and move towards healthier diets that are affordable for everyone in the Arab Region.

PART 1
RECENT TRENDS IN HUNGER, FOOD INSECURITY AND MALNUTRITION

RECENT TRENDS IN HUNGER, FOOD INSECURITY AND MALNUTRITION

In 2015 the world put forward a series of development goals designed to achieve a better and more sustainable future for all. SDG 2 calls for an end to hunger, achieving food security, improved nutrition and promoting sustainable agriculture by 2030. One–third of the way towards the target year, according to current trends, the NENA region is unlikely to achieve the first two SDG 2 targets: ending hunger (SDG Target 2.1) and all forms of malnutrition (SDG Target 2.2).[1] Not only are many countries off track, but indicators are trending in the opposite direction from that needed to meet those targets.

Part I of the Regional Overview of Food Security and Nutrition in the Near East and North Africa considers the latest available estimates of the SDG 2 indicators and assesses the possibility or otherwise of the Arab Region meeting country–level targets under SDG 2. Part I.A considers progress towards SDG hunger and food insecurity targets, while Part I.B addresses progress on global nutrition, including SDG targets and those set by the WHA in 2012 and

2013. Previous editions of the Regional Overview of Food Security and Nutrition in the Near East and North Africa have discussed extensively some of the reasons for the lack of progress on hunger and nutrition (FAO RNE, 2016, 2017, 2018, 2019). Part I.C discusses those targets in the context of the evidence in Parts I.A and I.B on progress towards SDG 2 hunger, food security and nutrition targets.

To implement SDG 2 the 2030 Agenda for Sustainable Development (UN SDG, 2015) outlined four indicators to measure fulfilment (Table 1). SDG Target 2.1 on ending hunger specifies two indicators and SDG Target 2.2 two indicators to assess fulfilment by 2030. In addition, the WHA set out intermediate targets for 2025 on nutrition and NCDs, outlined in two action plans on maternal, infant and young child nutrition (WHO, 2012) and prevention and control of NCDs (WHO, 2013).[2]

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[1] In this report the Arab Region includes the 22 member states of the Arab League: Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen.
[2] The WHA is the decision–making and policy setting body of the WHO made up of delegations from all WHO Member States convening annually in Geneva, Switzerland. The WHA endorsed a comprehensive implementation plan on maternal, infant and young child nutrition in 2012, and a Global Action Plan for the Prevention and Control of NCDs in 2013.

TABLE 1.
SDG AND WHA TARGETS AND INDICATORS

	TARGETS	INDICATORS	TARGET AND YEAR
SDG TARGET 2.1	By 2030, end hunger and ensure access by all people, in particular, the poor, and those in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.	2.1.1. Prevalence of undernourishment (PoU)	Eliminate (<2.5%) by 2030
		2.1.2. Prevalence of moderate or severe food insecurity in the population, based on the food insecurity experience scale (FIES)	Eliminate by 2030
SDG TARGET 2.2	By 2030, end all forms of malnutrition, including achieving, by 2025, internationally agreed targets on stunting and wasting in children under 5, and addressing the nutritional needs of adolescent girls, pregnant and lactating women and older persons.	2.2.1. Prevalence of stunting among children under 5	Eliminate by 2030
		2.2.2. Prevalence of malnutrition among children under 5 (wasting and overweight)	Eliminate by 2030
WHA NUTRITION AND NCD TARGETS	WHA nutrition targets*	Under 5 stunting	40% reduction in the number of children (2025)
		Anaemia among women of reproductive age	50% reduction in prevalence (2025)
		Under 5 overweight	No increase in prevalence (2025)
		Rate of exclusive breastfeeding in the first 6 months	Increase the rate to at least 50% (2025)
		Under 5 wasting	Reduce and maintain to less than 5% (2025)
	WHA NCD targets*	Prevalence of obesity in adults	Halt the rise (2025)

*Among the WHA nutrition targets, this report does not consider low birth weight (30% reduction). Among the WHA NCD targets, only obesity is considered.

Source: UN–SDG, 2015, WHO, 2012, 2013.

This publication analyses the two SDG targets focusing on hunger (Target 2.1) and malnutrition (Target 2.2), as well as selected WHA targets on nutrition and NCDs (Table 1). FAO is a custodian for SDG Target 2.1 on hunger and food insecurity and is responsible for calculating, monitoring and disseminating the indicators on achieving SDG Target 2.1. Indicator 2.1.1 is the traditional FAO measurement for prevalence of undernourishment and 2.1.2 builds on a relatively new survey–based FIES indicator of moderate or severe food insecurity in the population (Box 1).

BOX 1.
THE TWO MAIN SDG 2 INDICATORS OF HUNGER AND FOOD SECURITY

SDG Goal 2, Target 2.1, is measured through two independent indicators of hunger and food insecurity: the PoU and food insecurity measured by the FIES. The PoU measures the percentage of the population suffering caloric deprivation based on data from the food balance sheets (FBS) and other information. The FIES is a survey–based indicator of food insecurity based on answers to questions about limited access to food.

The PoU is FAO's indicator to monitor hunger using aggregate data on food available for human consumption from country FBS and surveys of food consumption. It compares the distribution of average, daily dietary energy consumption for each country with the distribution of dietary energy needs. The PoU returns an estimate of the percentage of individuals in the reference population that suffer caloric deprivation. The 2020 PoU indicator series should not be compared to previous editions as FAO produces a new series every year, often with improvements in methodology and data.

To compute an estimate of the PoU in a population for any given country, the probability distribution of habitual dietary energy consumption (DEC) levels (measured in kcal per person per day) for the average individual is modelled as a parametric probability density function, f(x). The indicator is obtained as the cumulative probability that the habitual dietary energy consumption (x) is below the minimum dietary energy requirements (MDER)[3].

For the 2020 State of Food Security and Nutrition in the World FAO estimated the PoU for each region and for the world through 2028–30. This was based on separate estimates of the underlying parameters of the probability model for 2028–30, the MDER, the DEC and the coefficient of variation.

Measuring the prevalence of food insecurity due to lack of money or other resources through the FIES is an estimate of individual or household food access. The severity of food insecurity is based on survey data using a set of eight questions which report conditions and experiences associated with limited access to food. Based on their responses to these questions, individuals or households are assigned to one of three groups: food secure or only marginally insecure; moderately food insecure; or severely food insecure. Calculations of prevalence of food insecurity result in two classes: (1) moderately to severely food insecure; and (2) severely food insecure. Moderate food insecurity means uncertainty about obtaining food, forcing individuals to reduce the quality or quantity of food during the year. It refers to a lack of consistent access to food, diminishing dietary quality with negative consequences for nutrition and health. People facing severe food insecurity are likely to have run out of food, experienced hunger and, in extreme circumstances, gone for days without eating, posing a grave risk to their health and life.

Source: FAO, IFAD, UNICEF, WFP and WHO, 2020.

[3] PoU estimation is based on the following formula: $PoU = \int_{x<MDER} f(x|\theta)dx$, where θ is a vector of parameters that characterizes the probability density function. The distribution is assumed to be lognormal, and thus fully described by only two parameters: the mean DEC, and its coefficient of variation.

1.1 PROGRESS TOWARDS HUNGER AND FOOD INSECURITY TARGETS

SDG Target 2.1 calls for the elimination of hunger and food insecurity and is assessed using the two FAO indicators for hunger and food insecurity: the PoU and the prevalence of food insecurity based on the FIES. According to current indicators, the average PoU for the region is trending upwards, meaning the region will not meet SDG Target 2.1 on hunger. The two FAO indicators on food insecurity have also been trending upwards, though 2017–19 saw a halt in this rise, as both severe and moderate to severe indicators of food insecurity fell. It is not possible to say whether this indicates a new trend or a temporary respite. What is certain is that based on current trends, it would require a major reversal in both the hunger and food insecurity indicators for the region to meet SGD Target 2.1.

SDG Indicator 2.1.1. Prevalence of undernourishment

Since at least 2000–02 there has been a sustained, consistent decline in undernourishment in the Arab countries. This downward trend came to a halt in 2014–16, after which the indicator started to rise. Figure 1 illustrates the reasons for the fall and rise. In the Arab region there is a wide gap in the prevalence of hunger between countries embroiled in conflict and those that are not.[4] Undernourishment in non–conflict countries has ranged between 5 and 8 percent since 2000–02 and has since trended downward. This level is about two to three times that of most developed countries where undernourishment is commonly less than 2.5 percent. Hunger in conflict countries has been much higher than in non–conflict countries, in the order of 24 to 30 percent (Figure 1) and trended downward up to 2014–16, after which it began to rise.

The prevalence of undernourishment for the region in Figure 1 is a population–weighted average of the two series for conflict and non–conflict countries. The average prevalence of undernourishment was 12.2 percent in 2017–19, a slight increase from 2014–16. The rise in this average indicator was caused nearly exclusively by an increase in the PoU in the Arab conflict countries. Figure 1 also shows FAO's projection of the prevalence of undernourishment for the Arab Region, for conflict countries and non–conflict countries based on current trends. All three indicators are projected to increase up to 2030 with prevalence in conflict countries rising from 25 to 30 percent.

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[4] Conflict and non–conflict countries are identified on the basis of the Center for Systemic Peace data on Major Episodes of Political Violence, 2012–2018. The cut–off of a minimum of ten episodes of all interstate and civil violence was applied for disaggregating countries into conflict/non–conflict categories. Six countries in the region fell into the category of conflict countries: Iraq, Libya, Somalia, Sudan, Syria and Yemen (https://www.systemicpeace.org/inscrdata.html).

FIGURE 1
PREVALENCE OF UNDERNOURISHMENT IN THE ARAB REGION, 2000-02 TO 2017-19, AND PROJECTION TO 2028-30
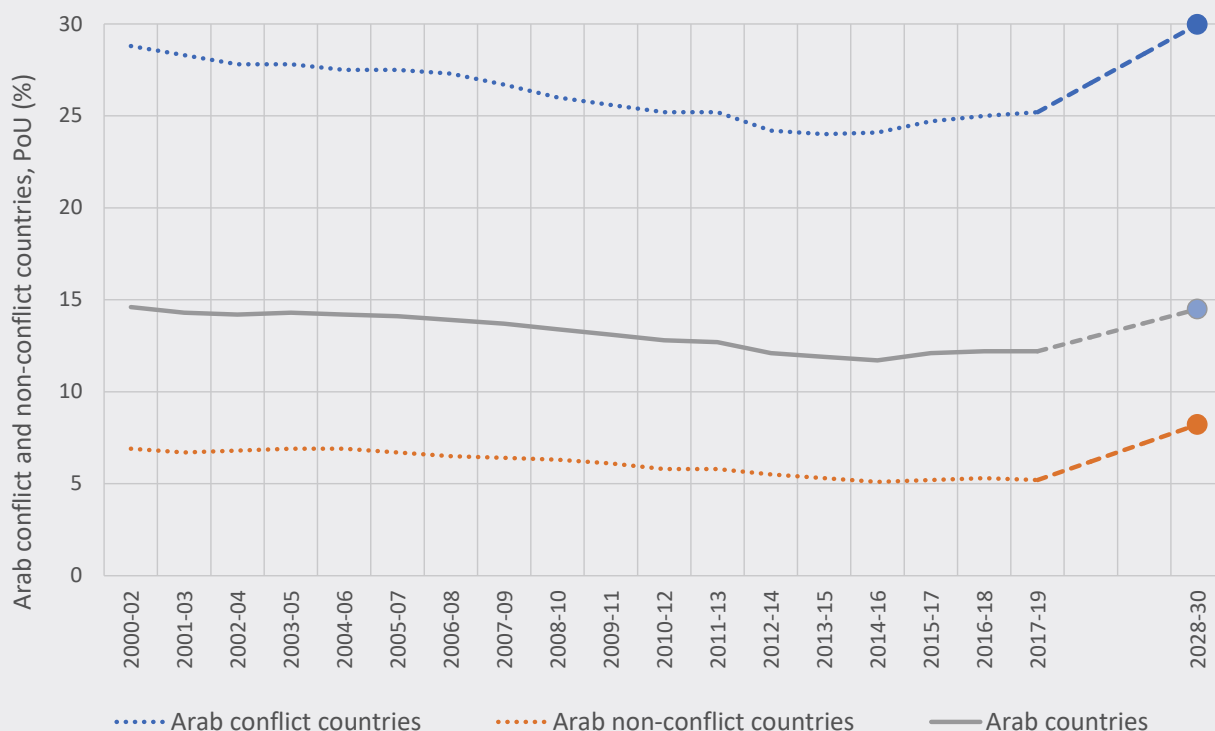
Note: The conflict countries aggregate includes the six currently in conflict: Iraq, Libya, Somalia, Sudan, Syria and Yemen. The non–conflict aggregate includes the other 16 countries of the Arab region in the note to Table 2.

Source: FAO FAOSTAT, 2020.

Table 2 shows the data underlying Figure 1 with average prevalence of undernourishment trending downward until 2014–16 and rising thereafter. This was driven by the pattern in conflict countries, which fell through 2013–15 and rose thereafter, and the series for non–conflict countries which also fell through 2014–16 and remained constant thereafter. The rising trend in the series drives the FAO projected increase in undernourishment for 2028–30.

Proceeding to the individual country estimates of Table 2, there are currently 22 countries in the region. Reliable data for nearly half of these

countries (nine) are missing. One of the primary reasons is prolonged conflict and the difficulties in producing reliable undernourishment estimates using pre–conflict data on income distribution or food consumption (Libya, Somalia, Syria, Yemen). The other countries lacking data are a mixture of high income (Bahrain and Qatar) and low or low–middle income countries (Comoros, Djibouti, Palestine). From the estimates in Table 2, the PoU is trending down in 9 of the 13 countries listed. Iraq and Sudan are the only conflict countries which FAO deems to have sufficiently reliable data to publish undernourishment estimates, both exhibiting a

decline until 2014–16 and 2015–17 respectively, followed by an increase. Other countries where undernourishment is trending upwards include Mauritania, Morocco and the United Arab Emirates. Of the non–conflict countries, Egypt, the most populous in the region, exhibits declining undernourishment trends until 2015–17, after which the figures level off. Because of its large population (36 percent of the total population of non–conflict countries in 2020), the trend in Egypt had a large impact on the overall trend for non–conflict countries (UNDESA, 2020).

TABLE 2.
PREVALENCE OF UNDERNOURISHMENT IN THE ARAB REGION AND SUB–REGIONS, 2007/09–2017/19 AND 2028/30 PROJECTION (%)

	2007–09	2009–11	2011–13	2013–15	2014–16	2015–17	2016–18	2017–19*	2028–2030**
Total Arab Region	13.7	13.1	12.7	11.9	11.7	12.1	12.2	12.2	14.5
ARAB SUB-REGIONS									
Conflict countries[a]	26.7	25.6	25.2	24.0	24.1	24.7	25.0	25.2	30.0
Non–conflict countries[b]	6.4	6.1	5.8	5.3	5.1	5.2	5.3	5.2	8.2
COUNTRIES FOR WHICH RELIABLE DATA ARE AVAILABLE									
Algeria	5.6	4.5	3.5	3.3	3.3	3.2	3.1	2.8	
Egypt	5.7	5.4	5.2	4.8	4.8	4.7	4.7	4.7	
Iraq	25.0	21.9	21.8	22.7	22.7	24.0	24.0	23.7	
Jordan	6.7	7.2	8.6	9.0	9.0	8.6	8.7	8.5	
Kuwait	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	
Lebanon	9.5	10.3	15	9.3	9.3	6.2	6.2	5.7	
Mauritania	7.4	7.4	7.1	7.9	7.9	10.8	11.7	11.9	
Morocco	5.7	5.6	4.9	4.1	4.1	3.8	4.0	4.3	
Oman	9.8	9.2	7.3	6.9	6.9	8.1	8.2	7.8	
Saudi Arabia	5.5	6	5.5	4.9	4.9	4.8	4.8	4.8	
Sudan	20.2	21.8	19.9	13.3	13.3	11.9	12.2	12.4	
Tunisia	3.9	3.5	3.2	2.7	2.7	<2.5	<2.5	<2.5	
United Arab Emirates	8.2	6.4	4.5	3.0	3.0	2.8	3.0	3.1	

Notes: *Projection. Reliable data for other countries are not available. Aggregates include imputed estimates for countries for which data are not available: a. Iraq, Libya, Somalia, Sudan, Syria and Yemen; b. Algeria, Bahrain, Comoros, Djibouti, Egypt, Jordan, Kuwait, Lebanon, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Tunisia and United Arab Emirates.

** The projections up to 2030 do not reflect the potential impact of the Covid–19 pandemic.

Source: FAOSTAT, 2020. Projections for 2028–30 are from the PoU projection tool at http://www.fao.org/publications/sofi/2020/en/

The absolute number of undernourished in the Arab Region has been increasing steadily since 2015–17 and that trend is projected to continue into the future (Table 3) from 51 million in 2017–19 to 75 million by 2028–30, with 92 percent of the 2017–19 increase in conflict countries.

TABLE 3.
NUMBER OF UNDERNOURISHED IN THE ARAB REGION AND SUB–REGIONS, 2007/09–2017/19 AND 2028/30 PROJECTION (MILLION)

	2005–07	2007–09	2009–11	2011–13	2013–15	2015–17	2016–18	2017–19*	2028–30**
Total Arab Region	45.6	46.4	46.5	47.1	46.2	48.7	50.3	51.4	75.3
ARAB SUB-REGIONS									
Conflict countries[a]	31.8	32.4	32.5	33.2	32.9	35.1	36.2	37.1	59.1
Non–conflict countries[b]	13.9	14.0	14.0	13.9	13.3	13.7	14.1	14.3	16.1
COUNTRIES FOR WHICH RELIABLE DATA ARE AVAILABLE									
Algeria	2.2	2	1.6	1.3	1.3	1.3	1.3	1.2	
Egypt	4.7	4.5	4.5	4.5	4.3	4.5	4.6	4.6	
Iraq	6.9	7.1	6.5	7	7.8	8.8	9	9.1	
Jordan	0.3	0.4	0.5	0.7	0.8	0.8	0.8	0.9	
Kuwait	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	
Lebanon	0.5	0.5	0.5	0.8	0.6	0.4	0.4	0.4	
Mauritania	0.3	0.2	0.3	0.3	0.3	0.5	0.5	0.5	
Morocco	1.8	1.8	1.8	1.6	1.4	1.3	1.4	1.6	
Oman	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	
Saudi Arabia	1.1	1.4	1.6	1.6	1.5	1.5	1.6	1.6	
Sudan	6.5	6.7	7.5	7.2	5.1	4.8	5	5.2	
Tunisia	0.4	0.4	0.4	0.3	0.3	n.r.	n.r.	n.r.	
United Arab Emirates	0.5	0.6	0.5	0.4	0.3	0.3	0.3	0.3	

Notes: *Projection. Reliable data for other countries are not available. Aggregates include imputed estimates for countries for which data are unavailable: a. Iraq, Libya, Somalia, Sudan, Syria and Yemen; b. Algeria, Bahrain, Comoros, Djibouti, Egypt, Jordan, Kuwait, Lebanon, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Tunisia and United Arab Emirates.

** The projections up to 2030 do not reflect the potential impact of the Covid–19 pandemic.

Source: FAO FAOSTAT, 2020. Projections for 2028–30 are from the PoU projection tool at http://www.fao.org/publications/sofi/2020/en/.

As Table 2 and Table 3 show, the Arab Region as a whole is not on track to reach SDG Target 2.1 and eliminate hunger. In fact, FAO projects increased undernourishment in the region from current levels in both conflict and non–conflict countries.

SDG indicator 2.1.2. Prevalence of moderate or severe food insecurity based on FIES

Average food insecurity in the Arab region based on the FIES exhibits a pattern similar to that of the PoU, growing since 2014–16, followed by a slight decline (Table 4). The prevalence of both severe and moderate to severe food insecurity in conflict countries rose every year since 2014–16. In non–conflict countries, food insecurity rose after 2014–16 and then slightly decreased. Thus, the trends in food insecurity, both severe and moderate to severe, in the region have been roughly consistent with the undernourishment trends in Table 2.

TABLE 4.
PREVALENCE OF PEOPLE AFFECTED BY FOOD INSECURITY IN THE ARAB REGION AND SUB–REGIONS, 2014/16–2017/19 (%)

	SEVERE				MODERATE OR SEVERE			
	2014–2016	2015–2017	2016–2018	2017–2019	2014–2016	2015–2017	2016–2018	2017–2019
Total Arab Region	11.0	11.5	11.7	11.4	30.1	31.8	32.8	32.6
ARAB SUB–REGIONS								
Conflict countries	14.8	15.9	16.6	16.9	39.2	41.0	42.1	42.8
Non–conflict countries	9.0	9.1	9.0	8.4	25.2	26.9	27.8	27.1
COUNTRIES								
Algeria	13.0	12.7	11.4	9.3	22.9	21.5	19.7	17.6
Egypt	8.4	9.0	8.9	7.8	27.8	33.0	36.0	34.2
Kuwait	4.9	4.9	4.9	4.9	12.6	12.4	12.3	12.3
Libya	11.2	12.4	14.3	16.8	29.1	30.9	33.2	35.9
Mauritania	14.2	18.7	22.1	22.4	31.6	37.6	42.5	44.8
Morocco	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	25.9
Palestine	n.a.	n.a.	4.4	4.4	n.a.	n.a.	26.3	26.3
Tunisia	9.1	9.3	9.1	9.1	18.2	19.4	20.0	20.0
Sudan	13.4	14.4	15.4	16.4	41.4	43.9	46.4	48.9

Notes: n.a.: Not available. Reliable data for other countries are not available nor are there estimates for missing countries.

Source: FAO FAOSTAT, 2020.

TABLE 5.
NUMBER OF PEOPLE AFFECTED BY FOOD INSECURITY IN THE ARAB REGION AND SUB–REGIONS, 2014/16–2017/19 (MILLION)

	SEVERE				MODERATE OR SEVERE			
	2014–2016	2015–2017	2016–2018	2017–2019	2014–2016	2015–2017	2016–2018	2017–2019
Total Arab Region	43.7	46.4	48.1	47.8	119.4	128.7	135.2	137.0
ARAB SUB-REGIONS								
Conflict countries	20.7	22.6	24.0	25.0	54.6	58.1	60.8	63.2
Non–conflict countries	23.0	23.8	24.1	22.9	64.7	70.6	74.3	73.8
COUNTRIES								
Algeria	5.2	5.1	4.7	3.9	9.1	8.7	8.2	7.4
Egypt	7.8	8.5	8.6	7.6	25.7	31.1	34.8	33.6
Kuwait	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.5
Libya	0.7	0.8	0.9	1.1	1.9	2.0	2.2	2.4
Mauritania	0.6	0.8	0.9	1.0	1.3	1.6	1.8	2.0
Morocco	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	9.3
Palestine	n.a.	n.a.	0.2	0.2	n.a.	n.a.	1.3	1.3
Sudan	5.2	5.8	6.3	6.8	16.1	17.5	19.0	20.4
Tunisia	1.0	1.1	1.0	1.1	2.0	2.2	2.3	2.3

Notes: n.a.: Not available. Reliable data for other countries are not available nor are there estimates for missing countries.

Source: FAO FAOSTAT, 2020.

While the absolute number of the severely food insecure peaked in 2016–18 and fell in 2017–19 (Table 5), uncertainty about access to food continues to increase in the region. The number of moderately or severely food insecure people continues to increase.

1.2 PROGRESS TOWARDS GLOBAL NUTRITION TARGETS

This section presents the latest estimates of progress towards the following global nutrition targets: a) Target 2.2 of the SDGs to eliminate all forms of malnutrition, to be achieved by 2030; b) Targets on maternal, infant and young child nutrition to be achieved by 2025, endorsed by the WHA in 2012; and c) NCD targets to be achieved by 2025, endorsed by the WHA in 2013. While WHA 2012 targets were initially to be achieved by 2025, some have been adjusted and extended up to 2030 to align with the 2030 SDG agenda[5].

The trend analysis is provided only for selected WHA targets as listed in Table 1 above.

SDG indicators 2.2.1 and 2.2.2 on child malnutrition

Table 6 shows the latest available estimates on the status of malnutrition of under 5 children for the Arab Region published by the inter–agency team at the UNICEF, WHO and the World Bank (WB) (UNICEF–WHO–WB, 2020), as well as the public health significance of those estimates according to the WHO classification. The table is divided into two parts, reflecting the survey year of the data, before and after 2010. The older estimates in Table 6 have likely changed and are thus less reliable as an indicator of the current status of child malnutrition. Box 2 defines and lists some of the consequences of the main nutritional status indicators for children under 5.

Based on the WHO classification of malnutrition severity as a public health problem, the Arab States have relatively high levels of stunting and medium levels of overweight in children under 5. The conflict countries, as expected, show high levels of undernutrition (stunting and wasting), while the non–conflict countries show high levels of overweight and medium levels of undernutrition. Some countries in the region (Comoros, Egypt, Libya and Syria) appear to be caught in a "double burden" of malnutrition with high levels of stunting *and* overweight. Others (Iraq, Jordan, Kuwait, Oman and Palestine) seem to have done comparatively well on indicators of both undernutrition and overweight. There seems to be only a weak correlation between the income status of the countries in these two categories. The "double burden" countries are a mixture of low, lower–middle and upper–middle–income countries, while the comparatively well–off countries include lower–middle, upper–middle and high–income countries.

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[5] The global nutrition targets to be achieved by 2030 are as follows: stunting children under 5 – 50 percent reduction; anaemia in women of reproductive age – 50 per cent reduction; low birth weight – 30 per cent reduction; childhood overweight – less than 3 per cent; exclusive breastfeeding – up to at least 70 per cent; wasting – less than 3 per cent.

TABLE 6.
CHILDREN'S NUTRITIONAL STATUS FOR ARAB REGION AND PUBLIC HEALTH SIGNIFICANCE, LATEST YEAR

	CHILDREN, 0–5, PREVALENCE, LATEST YEAR DATA			PUBLIC HEALTH SIGNIFICANCE			SURVEY YEAR
	WASTING (%)	OVERWEIGHT (%)	STUNTING (%)	WASTING	OVERWEIGHT	STUNTING	
Total Arab Region	9.2	9.9	22.5	Medium	Medium	High	2013
ARAB SUB-REGIONS							
Conflict countries	11.8	6.6	30.3	High	Medium	Very High	2012
Non–conflict countries	7.2	12.4	16.6	Medium	High	Medium	2012
COUNTRIES, DATA AFTER 2010							
Algeria	4.1	12.4	11.7	Low	High	Medium	2012–13
Comoros	11.2	10.6	31.1	High	High	Very high	2012
Djibouti	21.5	8.1	33.5	Very high	Medium	Very high	2012
Egypt	9.5	15.7	22.3	Medium	Very high	High	2014
Iraq	3.0	6.1	12.6	Low	Medium	Medium	2018
Jordan	2.4	4.7	7.8	Very low	Low	Low	2012
Kuwait	2.5	5.5	6.4	Low	Medium	Low	2017
Libya	10.2	29.6	38.1	High	Very high	Very high	2014
Mauritania	11.5	1.5	22.8	High	Very low	High	2018
Morocco	2.6	10.9	15.1	Low	High	Medium	2017–18
Oman	9.3	4.2	11.4	Medium	Low	Medium	2017
Palestine	1.2	8.2	7.4	Very low	Medium	Low	2014
Sudan	16.3	3.0	38.2	Very high	Low	Low	2014
Tunisia	2.1	17.2	8.4	Very low	Very high	Low	2018
Yemen	16.4	2.5	46.4	Very high	Low	Very high	2013
DATA BEFORE 2010							
Bahrain	6.6		13.6	Medium		Medium	1995
Lebanon	6.6	16.7	16.5	Medium	Very high	Medium	2004
Qatar	2.1	10.4	11.6	Very low	High	Medium	1995
Saudi Arabia	11.8	6.1	9.3	High	Medium	Low	2004–05
Somalia	14.3	3.0	25.3	High	Low	High	2009
Syria	11.5	17.9	27.9	High	Very high	High	2009–10

Source: UNICEF–WHO–WB, 2020; WHO, 2010.

BOX 2.
DEFINITIONS AND CONSEQUENCES OF THE MAIN NUTRITIONAL STATUS INDICATORS
FOR CHILDREN UNDER 5

Stunting indicates that a child has not achieved their genetic potential for height (Golden, 2009). A child whose height is more than two deviations below the WHO standard is considered stunted (WHO Multicentre Growth Reference Study Group, 2006). Stunting may be caused by retarded intrauterine growth, inadequate nutrition to support the development of infants and young children and frequent infections during early life (Pendergast and Humphrey, 2014). Stunting usually reflects the persistent, cumulative effects of poor nutrition and other deficits that may span several generations and can adversely affect the cognitive and physical growth of children, making for poor performance in school and lower lifetime incomes.
Prevalence cut–off values for public health significance for stunting are as follows: very low <2.5; low 2.5 –<10; medium 10–<20; high 20–<30; very high >=30.

Wasting refers to children who do not gain weight according to their genetic capacity. It indicates acute malnutrition and increases the risk of death in childhood from infectious diseases such as diarrhoea, pneumonia and measles.
Prevalence cut–off values for public health significance for wasting are as follows: very low <2.5; low 2.5 –<5; medium 5–<10; high 10–<15; very high >=15.

The prevalence of **overweight** in children is defined by the WHO child growth standards for overweight and obesity in infants and young children up to age 5 (WHO Overweight, 2019). The recent global increase in childhood overweight is linked to diet changes with increased intake of highly processed, energy–dense foods high in fat and sugar and the trend towards less physical activity.
Prevalence cut–off values for public health significance for child overweight are as follows: very low <2.5; low 2.5 –<5; medium 5–<10; high 10–<15; very high >=15.

Sources: WHO, 2010; WHO, 2014; WHO overweight, 2019.

WHA indicators on nutrition and non–communicable disease

The World Health Assembly laid out specific intermediate targets for maternal, infant and young child nutrition (WHO, 2012) and on the prevention and control of NCDs (WHO, 2013) to be achieved by 2025 (Table 1). The last section reported the latest figures on child malnutrition.

Table 7 shows the latest estimates of anaemia in women of reproductive age, the percentage of infants exclusively breastfed up to six months of age and the prevalence of adult obesity. Anaemia is measured as the proportion of women between 15 and 49 with haemoglobin (Hb) concentration below a threshold level (<120 g/l for non–pregnant and lactating women, <110

g/l for pregnant women, adjusted for altitude and smoking habits) and occurs when the red blood cells do not carry enough oxygen to the body tissues. The public health significance of anaemia in women of reproductive age is moderate throughout the region with the exception of a group of high–income countries (such as Bahrain, Saudi Arabia) and low–income ones (such as Somalia and Yemen) where it is a severe public health problem. The most common cause of anaemia is low consumption of iron–rich foods, e.g. meat products, legumes and/or inadequate iron absorption. This often leads to iron deficiency, which accounts for most anaemia globally. Iron deficiency during pregnancy is a risk factor for preterm delivery, low birth weight and poor neonatal health (Allen, 2000).

TABLE 7.
SELECTED WHA INDICATORS OF MATERNAL AND INFANT NUTRITION AND NON–COMMUNICABLE DISEASE FOR THE ARAB REGION (LATEST ESTIMATES)

	PREVALENCE OF ANAEMIA (%)		EXCLUSIVE BREASTFEEDING (%)		
	AMONG WOMEN OF REPRODUCTIVE AGE (15–49), 2016	PUBLIC HEALTH SIGNIFICANCE	AMONG INFANTS FOR FIRST 6 MONTHS (% OF CHILDREN, 0–6 MONTHS)	SURVEY YEAR	PREVALENCE OF ADULT OBESITY (% OF POPULATION 18 YEARS AND OLDER), 2016
Total Arab Region	35.1	Moderate	38.7		27.0
COUNTRIES					
Algeria	35.7	Moderate	25.4	2012	27.4
Bahrain	42.0	Severe	n.d.		29.8
Comoros	29.3	Moderate	11.4	2012	7.8
Djibouti	32.7	Moderate	12.4	2012	13.5
Egypt	28.5	Moderate	39.5	2014	32.0
Iraq	29.1	Moderate	25.8	2018	30.4
Jordan	34.7	Moderate	25.4	2017	35.5
Kuwait	23.8	Moderate	n.d.		37.9
Lebanon	31.2	Moderate	n.d.		32.0
Libya	32.5	Moderate	n.d.		32.5
Mauritania	37.2	Moderate	40.33	2018	12.7
Morocco	36.9	Moderate	35.0	2017	26.1
Oman	38.2	Moderate	23.2	2017	27.0
Palestine	n.d.		38.1	2014	
Qatar	27.7	Moderate	29.3	2012	35.1
Saudi Arabia	42.9	Severe	n.d.		35.4
Somalia	44.4	Severe	5.3	2009	8.3
Sudan	30.7	Moderate	54.6	2014	n.d.
Syria	33.6	Moderate	42.6	2009	27.8
Tunisia	31.2	Moderate	13.5	2018	26.9
United Arab Emirates	27.8	Moderate	n.d.		31.7
Yemen	69.6	Severe	9.7	2013	17.1

Note: n.d. = No data.

Sources: WHO Global Health, 2020 (obesity); WHO Global Targets, 2020 (anaemia and breastfeeding); WHO, 2015 (anaemia public health significance).

WHO and UNICEF recommend initiation of breastfeeding within one hour of birth, exclusive breastfeeding for the first six months of life, with continued breastfeeding up to 2 years of age or beyond, accompanied by solid foods (WHO, 2019). Based on meta–analyses of breastfeeding outcomes in children and mothers, children who are breastfed for longer have lower morbidity and mortality from infections compared to those breastfed for shorter periods or not breastfed at all (Victora *et al.*, 2016). The data in Table 7 are therefore disappointing as they indicate less than 40 percent of women exclusively breastfeed through the first six months of their child's life. Only a handful of countries in the region stand out, where between 40 and 50 percent of infants are breastfed for the first six months of life: Egypt, Mauritania, Sudan and Syria.

With 27 percent of the adult population obese, the Arab region ranked second in the world for obesity after the Americas with 28.6 percent

(WHO Global Health, 2020). Forty–five percent of the countries in the region had between 31 and 40 percent obesity and 30 percent had a prevalence between 21 and 30 percent (Figure 2). Obesity is a risk factor for a wide range of health problems, such as type 2 diabetes, high blood pressure, heart disease, strokes, certain types of cancer, osteoarthritis, liver and kidney disease (CDC, 2020) and represents one of the greatest health challenges in the region.

The centrality of obesity as a health risk factor in the Arab Region is worth underlining. While the theme of this year's *Regional Overview* is resilience, it is difficult to achieve food system resilience without due attention to the need to transform the food system to ensure healthy diets for all. The 2019 edition of the Regional Overview (FAO–RNE *et al*, 2020) discussed measures for rethinking food systems to achieve healthy diets and improved nutrition in the region. See Figure 2, data based on Table 5.

FIGURE 2.
HISTOGRAM OF ADULT OBESITY PREVALENCE IN THE ARAB REGION, 2016

Meeting the 2025 WHA nutrition targets: are countries on track?
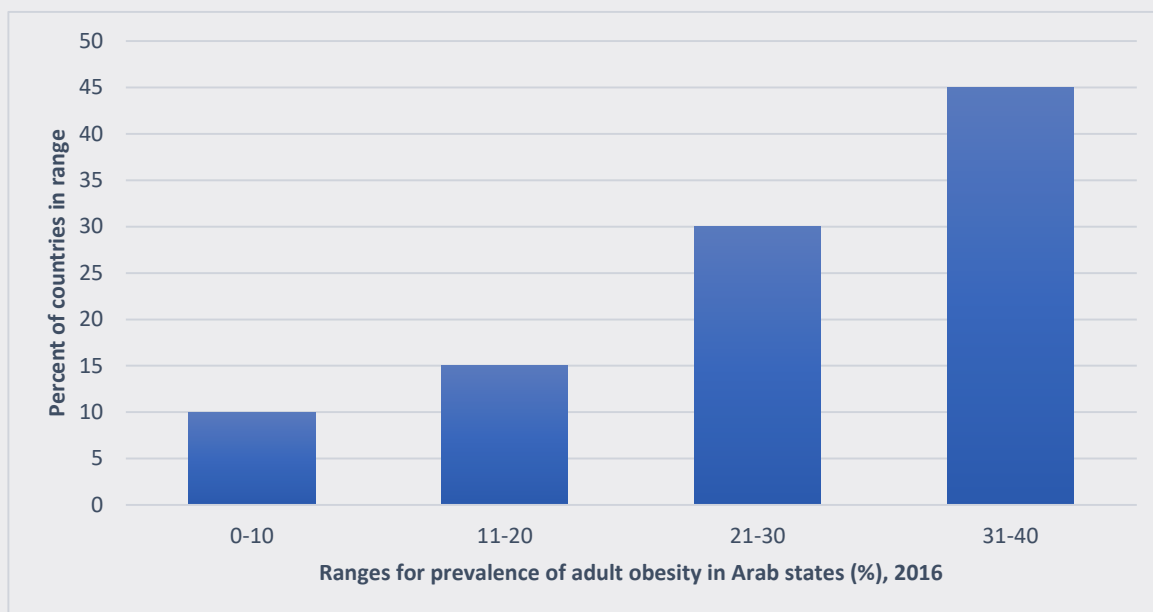
Progress in the Arab Region on the global nutrition targets has been slow and partial. Very few of the countries of the region are on track to reach WHA childhood nutrition targets by 2025 (Table 8).[6] For wasting, 7 out of 22 countries are on track, 11 countries are not on track and 3 do not have the requisite data.

For stunting, only 3 countries are on track, 7 countries are not on track, while 12 do not have the requisite data. For childhood overweight, only 3 countries are on track, 8 countries are not on track and 11 do not have the requisite data.

TABLE 8.
PREVALENCE OF CHILDHOOD STUNTING, WASTING AND OVERWEIGHT: LATEST YEAR, WHA TARGET AND TREND

COUNTRY	CHILDHOOD STUNTING (0–5) (%)			CHILDHOOD WASTING (0–5) (%)			CHILDHOOD OVERWEIGHT (0–5) (%)		
	LATEST YEAR	2025 TARGET	TREND ON TARGET?	LATEST YEAR	2025 TARGET	TREND ON TARGET?	LATEST YEAR	2025 TARGET	TREND ON TARGET?
Algeria	11.7	6.6	n.d.	4.1	<5%	√	12.4	no rise	n.d.
Bahrain			n.d.		<5%	n.d.		no rise	n.d.
Comoros	31.1	16.1	n.d.	11.2	<5%	X	10.6	no rise	n.d.
Djibouti	33.5	19.3	n.d.	21.5	<5%	X	8.1	no rise	n.d.
Egypt	30.7	11.5	X	7.9	<5%	X	20.4	no rise	√
Iraq	22.1	10.3	√	6.5	<5%	√	11.4	no rise	√
Jordan	7.8	5.1	X	2.4	<5%	√	4.7	no rise	n.d.
Kuwait	4.3	3.1	n.d.	2.4	<5%	√	9.5	no rise	√
Lebanon			n.d.		<5%	n.d.		no rise	n.d.
Libya	21	10.6	n.d.	6.5	<5%	X	22.4	no rise	X
Mauritania	23	10.8	X	11.7	<5%	X	1.2	no rise	X
Morocco	14.9	8.6	X	2.3	<5%	√	10.8	no rise	X
Oman	9.8	3.4	X	7.1	<5%	X	1.7	no rise	X
Palestine	10.9	5.2	√	3.3	<5%	√	5.3	no rise	X
Qatar			n.d.		<5%	X		no rise	n.d.
Saudi Arabia	9.3	4.1	n.d.	11.8	<5%	X	6.1	no rise	n.d.
Somalia	25.3	9.3	n.d.	14.3	<5%	X	3	no rise	n.d.
Sudan	34.1	15.4	X	15.4	<5%	X	1.5	no rise	X
Syrian Arab Republic	27.9	18.7	n.d.	11.5	<5%	X	17.9	no rise	n.d.
Tunisia	10.1	6.1	√	2.8	<5%	√	14.3	no rise	X
United Arab Emirates			n.d.		<5%	n.d.		no rise	n.d.
Yemen	46.6	23.6	X	13.3	<5%	X	1.5	no rise	X

Note: √=yes, X=no, n.d.= No data.

Source: WHO Global Targets, 2020.

[6] Though the WHA action plan on maternal, infant and young child nutrition (WHO, 2012) specifies target levels for 2025 from a base year of 2012, surveys of children's nutrition status that provide the indicators do not take place every year. In fact, some countries have not carried out these surveys since the 1990s. Therefore, it is impossible to generate a trend for many of the countries of the region. Of the 22 countries, it is possible to generate linear trends (which require data for the base year and for an additional year) for only about half of them for stunting and overweight and for 19 countries in the case of wasting.

The WHA target for anaemia in women of reproductive age is to reduce it by half by 2025, while the adult obesity target is to halt its rise. Information on these two indicators is easier to track, since the WHO publishes the data every year. However, none of the countries in the region are on track to meet WHA targets for anaemia or obesity by 2025 (Table 9).

TABLE 9.
PREVALENCE OF ANAEMIA IN WOMEN OF REPRODUCTIVE AGE AND ADULT OBESITY: BASE YEAR, WHA TARGET AND TREND

COUNTRY	PREVALENCE OF ANAEMIA IN WOMEN OF REPRODUCTIVE AGE (%)			PREVALENCE OF ADULT OBESITY (%)		
	BASE YEAR (2012)	2025 TARGET	TREND ON TARGET?	BASE YEAR (2012)	2025 TARGET	TREND ON TARGET?
Algeria	33.6	16.7	X	24.7	24.7	X
Bahrain	41.4	20.6	X	27.6	27.6	X
Comoros	27.6	13.8	X	6.7	6.7	X
Djibouti	30.9	15.4	X	12.3	12.3	X
Egypt	29.3	14.6	X	29.3	29.3	X
Iraq	29	14.5	X	28	28	X
Jordan	30.8	15.4	X	33.1	33.1	X
Kuwait	21	10.5	X	35.6	35.6	X
Lebanon	28.1	14	X	29.7	29.7	X
Libya	30.5	15.2	X	30	30	X
Mauritania	37.5	18.6	X	11	11	X
Morocco	34.2	17.1	X	23.4	23.4	X
Oman	36.3	18.1	X	24.3	24.3	X
Palestine	27.3	13.6	X	n.d.	n.d.	X
Saudi Arabia	41.5	20.7	X	32.8	32.8	X
Somalia	43.5	21.7	X	7	7	X
Sudan	29.4	14.7	X	n.d.	n.d.	
Syrian Arab Republic	31.7	15.8	X	25.1	25.1	X
Tunisia	28.1	14	X	24.6	24.6	X
United Arab Emirates	25.7	12.8	X	29	29	X
Yemen	65.5	32.7	X	14.6	14.6	X

Note: √=yes, X=no, n.d.= No data.

Source: WHO Global Targets, 2020; WHO Global Health, 2020.

CONCLUDING REMARK

Part I of this *Overview* argued that the average regionwide status of hunger improved substantially between 2000 and 2014. Though between 11 and 12 percent of the adult population still suffered from hunger and severe food insecurity, the direction of change in the region was still positive.

As the most recent estimates show, the improvement in the prevalence of hunger in the Arab Region has now halted and reversed, and has entered a new trajectory that is incompatible with meeting the SDG 2 targets. A look at progress on SDG 2 since 2015 is disappointing. Though there are insufficient data to establish clear trends in all countries for all indicators, only a handful of countries now seem likely to meet the SDG targets for 2030 on stunting, wasting and overweight, and none are on track to reach WHA targets anaemia in women of reproductive age and adult obesity for 2025.

Some of the reasons for the gradual reversal in the hunger target and slow progress on malnutrition SDG targets have been discussed in previous editions of the Regional Overview of Food Security and Nutrition in the Near East and North Africa (FAO–RNE, 2016, 2017, 2018, 2019). Chief among the reasons for slower reduction in undernourishment has been conflict, though food system weaknesses have also prevented the region from making progress on the obesity epidemic.

The impact of Covid–19 on the Arab Region economy will further complicate the challenge of achieving the SDG target of Zero Hunger. The full impact of the pandemic on food security in the region is difficult to assess in this report, which reflects the pre–COVID–19 situation. However, the pandemic has further exposed regional vulnerabilities, which are discussed at length in Part 2. Disruptions to livelihoods, job losses and successive disruptions in food systems in terms of food price hikes and reduced demand for nutritious food due to income losses will boost the numbers of the food insecure and undernourished in the region. Higher prices, especially for nutritious foods, and weakened purchasing power will negatively impact on the quantity, diversity and quality of diets, and consequently increase the risk of malnutrition. Most vulnerable population groups in low–income countries and countries in protracted crisis are likely to be hit the hardest.
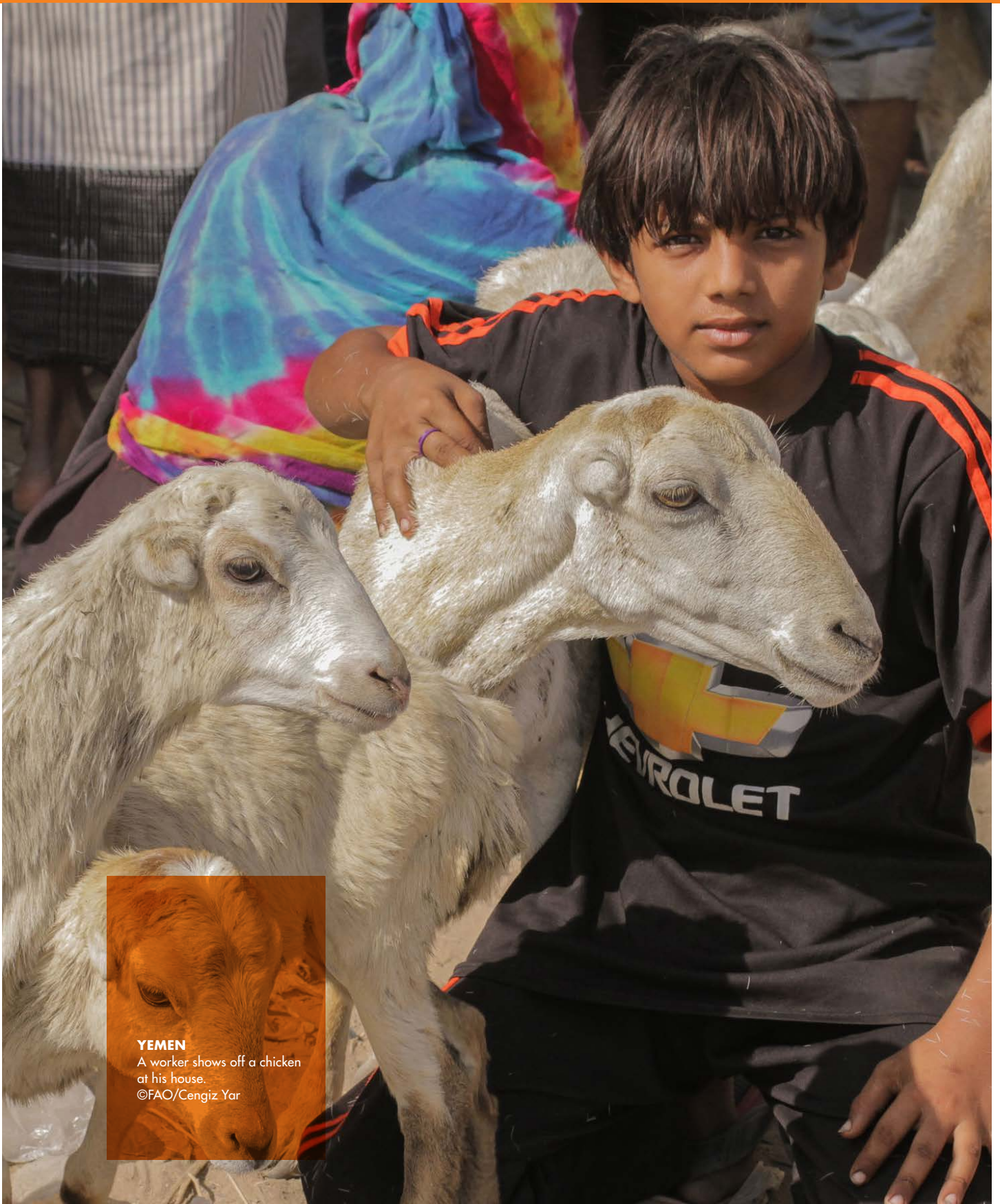
YEMEN
A worker shows off a chicken at his house.
©FAO/Cengiz Yar

WEST BANK AND GAZA STRIP
A Palestinian herder grazing his sheep.
©FAO/Marco Longari
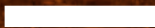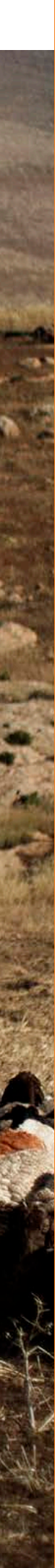
PART 2
ENHANCING THE
RESILIENCE OF
FOOD SYSTEMS IN
THE ARAB REGION

ENHANCING THE RESILIENCE OF FOOD SYSTEMS IN THE ARAB REGION

Resilience in the food system is crucial to deliver food and nutrition security in the region (El Bilali et al., 2018). Part 2 uses a conceptual framework to analyse the resilience of food systems. It then discusses various shocks in the region (climatic, macroeconomic, conflicts, health) that impact on food security and nutrition. Part 2 also analyses food system vulnerabilities and resilience capacities, including the relationship between shocks and different components of food systems. It reviews policy responses to alleviate the impact of those shocks and the cost and affordability of healthy diets in a non–crisis situation. This is followed by recommended policy directions and actions to make the region's food systems more shock–proof and resilient to accelerate the much needed transformation towards sustainable healthy food systems and to achieve the SDGs.

2.1 CONCEPTUAL FRAMEWORK FOR ASSESSING FOOD SYSTEMS' RESILIENCE

2.1.1 Why a food systems approach? What are the complex relationships between different food system components?

Food security is multidimensional and multirelational, as the network of determining factors reinforce and affect each other.

It is an outcome of the food system, a complex socio–ecological system with connected biophysical and social components. Understanding this is essential for food security, taking into account the different elements of the food system, their relationship and impacts on its own components. This approach considers the food system in its totality, not limited to a single sector or discipline (FAO, 2018). Adopting a food systems approach helps identify and select multiple entry points to achieve desirable policy goals such as improved food security and nutrition, but also sustainability and systemic resilience.

Using the concept of a food system to describe the pathway of food from farm to fork dates back at least four decades (Kneen, 1989). Several definitions of a food system have emerged but this Overview relies on that provided by the High Level Panel of Experts (HLPE) of the Committee on World Food Security (CFS): a system that "gathers all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the outputs of these activities, including socio–economic and environmental outcomes" (HLPE, 2017).

A food system framework has three interlinked components: the food supply chain; the food environment; and consumer behaviour. Fanzo *et al.* (2020) expanded this to include a fourth component, individual level filters, those factors which provide an interface between the food environment and consumers' behaviour. Drivers in a complex set of interactions involving positive and negative feedback loops influence

these components[7]. The system produces several outcomes: food and nutrition security and economic, social and environmental outcomes.

This framework is the basis of the approach to food systems in this report (see Figure 3).

FIGURE 3.
CONCEPTUAL FRAMEWORK OF A FOOD SYSTEM
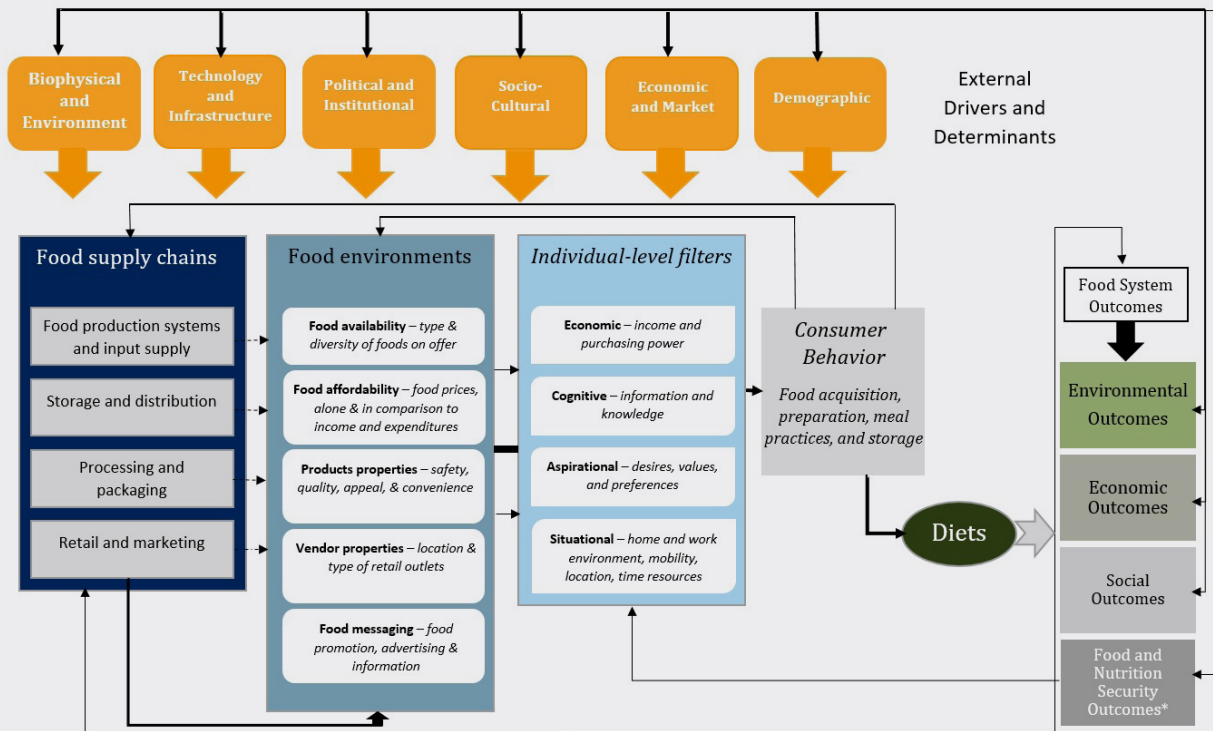
Source: Adapted from Fanzo *et al.,* 2020 and foodsystemdashboard.org.

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[7] Drivers of food systems are "endogenous or exogenous processes that deliberately or unintentionally affect or influence a food system over a long-enough period of time so that their impacts result in altering durably the activities (or actors' behaviors), and subsequently the outcomes, of that system" (Béné et al., 2020).

The usefulness of a food system to analyse food and nutrition security processes and other outcomes is that it allows a multi–scalar, historical and spatial analysis. The analysis can be global, national, or local, over a shorter time (seasons, usually associated with local scales), or longer (decades such as national or planetary levels). The analysis refers principally to the national level, in line with the data and indicators available and with previous Overviews.

The food system has many complex subsystems (farming, input supply, waste management, trade, etc.) which interact and are impacted by drivers. It produces food and nutrition security as its principal output but also environmental outputs such as agrarian landscapes, economic outputs like wealth creation and social outputs such as livelihoods. These, in turn, impact on the drivers and alter them, influencing the food system, positively or negatively. Affordable, healthy diets that maintain human health are precursors of food security and nutrition and the food system output needed to meet SDG 2 and WHA targets. As discussed later, adopting a healthy diet also benefits the environment by reducing GHG emissions which contribute to climate change. Climate is one of the primary but not the exclusive driver affecting production in the food supply chain.

Food system outcomes (food and nutrition security, environmental, social and economic) are the product of the interaction of drivers with food system components and decisions taken by actors (farmers, intermediaries and consumers) and policymakers. Food policies are drivers of the food system and can have positive food security and nutrition outcomes by promoting affordable healthy diets, or negative outcomes by directly or indirectly promoting unhealthy diets, which can also lead to poor environmental and health outcomes (see section 2.3.2 for further analysis). Food systems also play an important role in societal well–being – they help to ensure members of society are as healthy as possible through, for example, equitable access to a healthy diet. They can

also guarantee that food system workers have well paid jobs and safe working conditions. Considering the food system is one of the main sectors of employment or sources of livelihoods (e.g. agriculture in rural areas), changes in food systems or dietary patterns can have extensive economic effects on farmers, processors, retail owners and consumers.

Food system outcomes feed back into the drivers and thus influence the components. Excessive reliance on blue water[8] extraction caused by the global expansion in irrigated agriculture is one of the negative outcomes of the food system, which feeds negatively into the biophysical and environmental driver. This impact can be experienced at planetary, national and local scales (spatial dimensions) and tends to increase over time (temporal scale) without action to reverse the trend. Positive feedback loops can also occur and coexist with negative feedback. High blue water extraction can increase farmers' yields and incomes and deliver temporary positive feedback to the sociocultural driver, while having a negative impact on the biophysical and environment driver through depleted natural resources.

2.1.2 Food systems' resilience: concept and indicators

Food systems are exposed to shocks and stresses both natural and human, such as war and conflicts, economic crises, unfavourable climatic conditions, including pests, droughts and floods and, as Covid–19 has shown, pandemics. This report uses definitions of shocks and stresses adapted from Choularton *et.al.*, 2015, cited in Sagara, 2018. Shocks are "external short–term deviations from long–term trends that have substantial negative effects" on the current state of the system. Shocks are usually but not always acute (rapid onset, typically short duration) events like flooding, disease, or market fluctuations but they can be slow onset

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[8] Precipitation over land is divided into two types: green water that irrigates soil and plants, the basis of rainfed farming and pasture grazing and blue water, surface or groundwater used for agricultural irrigation. Grey water is recycled wastewater.

like drought. Stresses are "long–term trends or pressures that undermine the stability of a system and increase vulnerability within it". Stresses can be chronic (slow onset, typically protracted duration), and can include population pressure, climate variability, chronic poverty, and protracted crisis. Acute shocks and stresses occur rapidly at one point in time, whereas chronic shocks and stresses occur over longer periods of time with effects felt long after the event itself.

Shocks coupled with existing weaknesses result in serious system perturbations, as the shock reverberates through the system gaining amplitude, the ripple through effect. Disturbances can be internal or external, cyclical or structural, sudden or gradual (Tendall *et al.*, 2015). A shock can affect one of the components or may have serious impacts on

several components, as they are all interlinked. The ability to withstand or recover from shocks or stresses is termed resilience and is desirable for food systems, enabling them to absorb disturbances with limited negative impacts on their outputs.

Resilient food systems can adapt and reconfigure themselves following a disturbance to produce the same output as the initial system, although usually via different pathways and capacities contribute to that resilience (Sagara, 2018; Béné, 2020) similar to the "pillars of resilience" used by FAO's Resilience Index Measurement and Analysis (RIMA)–II[9] approach to assess household food security resilience. Figure 4 shows Sagara's simplified model of resilience adapted for food systems.

FIGURE 4.
SIMPLIFIED MODEL OF RESILIENCE FOR FOOD SYSTEMS SHOWING THE FUNCTION OF RESILIENCE CAPACITIES
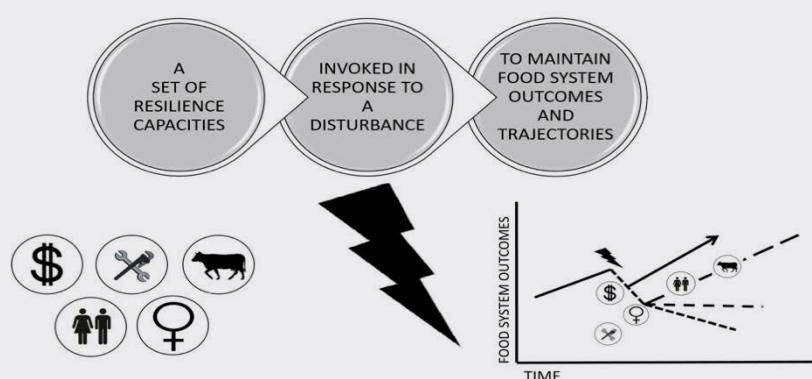
Source: Adapted for food systems from Sagara 2018

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[9] RIMA-II is the technical evolution of the FAO Resilience Index Measurement and Analysis (RIMA) tool. RIMA-II provides an indirect measure of resilience and allows causal inference (FAO, 2016)

Resilience and sustainability

Resilience is often associated with sustainability, although theoretically a resilient food system that continues to deliver outputs in spite of shocks does not necessarily have to be sustainable. FAO defines a sustainable food system (SFS) as one "that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised" (FAO, 2018). An SFS must be profitable throughout (economic sustainability); provide broad–based benefits for society (social sustainability); and have a positive or neutral impact on the environment (environmental sustainability). It provides food security and nutrition outcomes from affordable healthy diets without environmental costs.

Food system resilience can be associated with sustainability when defined as contributing

to achieving SDG goals despite disturbances and shocks (Tendall *et al.*, 2015). The literature emphasizes the need for a food system to be sustainable and resilient enough to cope with threats and uncertainties (Global Panel, 2016; UNSDG, 2015; HLPE, 2017).

The two concepts are mutually reinforcing: if sustainability delivers positive outcomes from a food system, resilience is the continued delivery of these positive outcomes following a shock or a disturbance. Food system persistence depends on it being sustainable and resilient as the same set of indicators can determine its sustainability and resilience. While trends in the change of indicators reveal sustainability with the time taken to reach a pre–set target (such as the SDG indicators associated with food system outputs), resilience can be estimated by the response of the same trend to shocks and stresses.

FIGURE 5.
RESILIENCE AND SUSTAINABILITY: COMPLEMENTARY CONCEPTS (TENDALL, *ET AL.*, 2015)

Measuring resilience: concepts and indicators

Resilience is not easily measured. It is a latent construct which can only be revealed after a disturbance and although it cannot be inferred it can be directly or indirectly assessed from proxy measures (FAO, 2016; Chodur *et al.*, 2018; Béné, 2020). This involves a set of indicators to

directly measure the trend in outcome evolution following a disturbance. Indirect measurement assesses the adequacy of resilience capacities of one, or preferably all, food system components. Box 3 provides a brief description of two ways to measure resilience, the drawbacks of each and offers a set of measurement indicators for the Arab Region.

BOX 3.
APPROACHES FOR MEASURING FOOD SYSTEM RESILIENCE

Direct measurement of resilience: assessing change in food system outcomes following a disturbance

A simple indicator of food system resilience is to study the trend of change in food security and nutrition indicators, as presented in Part 1. The PoU trends of change over 20 years in Figure 1 as well as data from Tables 2 (PoU) and 4 (FIES) show that the percentage of people in the Arab Region experiencing food insecurity and undernourishment has risen with the increase in conflict. This indicates the food system in conflict countries lacks resilience to the shock inflicted by war. This perspective is only partial because an evaluation of food system resilience involves assessing change in other food system outcomes, environmental, economic and social, for which data are generally unavailable. Such a model can be constructed with a set of indicators such as those used by Béné *et al.*, (2020) to compute his sustainability scores, or developing a resilience indicator set that includes SDGs. A suggested list of indicators relevant to the Arab Region with SDG indicators appears in Table A.1 of the Annex.

Indirect measurement of resilience: assessing the resilience capacity of one or more key food system components

Kummu *et al.*, (2020) adopted a different approach to measure national–level resilience of trade–dependent food systems, based on resilience principles (RP), similar to resilience capacities presented earlier. RPs are crucial and represent qualities essential for resilience in a food system. In trade–based food systems, RPs maintain diversity and redundancy[10] and manage connectivity. The general assumption of this model is that an increase in the number, diversity and connectivity of trade partners will enhance resilience by buffering system disruptions to the food supply chain. Using FAO data and other sources, they assign a score to these four parameters for 1987–89 and 2011–13. Changed RP values indicates the food system's resilience according to proxy indicators. The major drawback is that it estimates the resilience of food imports and trade, only one element of the food supply chain and provides insufficient information about the resilience of food system outputs, especially food security. Building a complete picture of resilience requires indicators for every food system component.

2.2 HOW SHOCKS AND STRESSES WORSEN FOOD SECURITY AND NUTRITION IN THE ARAB REGION, CONTRIBUTING TO RISING HUNGER AND MALNUTRITION

Previous issues of this Overview analysed how policies have neglected or exacerbated key weaknesses in the Arab agrifood economy to worsen food security and nutrition.

In addition to poor policies, shocks and stresses can impact on the agrifood economy to worsen hunger and nutrition. As defined earlier, shocks are usually short–term, rapid, high intensity onset events. Though relatively short they can have substantial effects on the food system, such as floods, market fluctuations or disease

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[10] Redundancy is a system property that allows some system elements to compensate for the loss or failure of others. It is essentially the opposite of disparity (Biggs et al., 2012).

and also longer events such as droughts. Stresses are defined as external negative pressures on the food system associated with system drivers that increase its vulnerability. They can include demographic pressures, climate variability, chronic poverty and protracted crises. Shocks and stresses can be acute or chronic, causing disturbances that inhibit efficient food system operation.

Section 2.2.1 reviews evidence and presents data on three main shocks to the Arab food system and section 2.2.2 addresses the major stresses contributing to increased food system vulnerability that multiply the damage caused by shocks.

2.2.1 Shocks to Arab food systems: a review of evidence and impact

The principal shock in the Arab Region is violence and conflict, the primary reason for the halt in the decline in hunger in the region (Figure 1, Part 1). Other shocks can worsen food security and nutrition. Climate shocks cause more frequent droughts, while plant/animal/human disease vectors and pests such as desert locusts, can act on increasingly fragile natural resources to reduce livelihoods leading to food insecurity. Macroeconomic shocks, internal and external (food price rises, fluctuating oil prices and tourism revenues), can lead to economic slowdowns and downturns, affecting food security, although various groups will be affected differently. Covid–19 and public health measures to contain its spread have also negatively affected livelihoods, threatening to increase hunger. This section explores three shocks that worsen hunger and nutrition: climate–related, macroeconomic and Covid–19.

Climate–related shocks

Climate change is an exceptional disturbance factor for the food system, presenting both shocks and stresses. It is slow onset and long–term but its impacts are devastating. It can

generate rapid onset shocks such as floods or pest epidemics and exacerbate stresses such as chronic poverty, health and water availability.

Anthropic climate change caused by GHGs is a shared negative externality. Though the Arab Region contributes less than 5 percent of world GHG emissions (IPCC, 2008), it is extremely vulnerable to the effects of climate change due to water scarcity, susceptible coastal areas and arid climate (AFED, 2009).[11]

The impact of climate change can increase hunger and worsen nutrition through two main pathways. First, it affects livelihoods and productivity by altering growing conditions and increasing the risk of plant and animal diseases which depend on higher temperatures. Altered growing conditions may mean unpredictable seasonal variations affecting the crop calendar with increased risk of crop failure, late or early frosts, erratic rainfall and variable temperatures. This can increase the vulnerability and poverty of small producers and be a driver of migration towards urban centres. Second, it can affect the ability of segments of the population to buy sufficient quantities of healthy food and water by damaging their livelihoods as well as reducing availability of nutritious foods. Climate change can limit access to healthy diets, while some unhealthy diets contribute to climate change by promoting increased GHG emissions.

The main projected climate change effects on agricultural producer livelihoods are: (1) increased temperatures; (2) water shortages; (3) sea level rises leading to inundation of low–lying lands; and (4) an increase in natural disasters, such as floods, sandstorms and droughts (Verner, 2012). However, climate change affects livelihoods in many more ways such as the social and environmental determinants of quality of life and health – clean air and drinking water, sufficient food and safe shelter. Increasing temperatures have deleterious health effects on people with coronary disease, asthma, the elderly, and the very young. People in urban areas (59 percent of the Arab population in 2019)

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[11] In the Arab Region in 2017, 19 out of 20 countries for which data are available had total renewable water resources of 1 000 cubic metres or less per person, the generally accepted water scarcity line (FAO AQUASTAT, 2020).

can expect a decrease in water and air quality due to seawater intrusion into groundwater, smog events, increased particulate air pollution from dust storms, infrastructure failure (storm water and sewerage networks), electricity blackouts due to decreased hydroelectric dam water flow, coastal erosion and increased flooding from rising sea levels (Farajalla, n.d.). The poor of the region are the most vulnerable to these threats to life and health. Many of the urban poor live in informal settlements in low lying areas subject to flooding with poor housing, electricity service, water quality and sanitation without air conditioning (World Bank, 2014).[12] The rural poor are also more vulnerable to drought because they use water for many more purposes than people in urban areas. For the rural poor it is a source of drinking water and sanitation but also the backbone of their livelihoods. As irrigation water declines the livelihoods of poor rural inhabitants will also diminish, pushing them further into poverty (Barker, Van Koppen and Shah, 2000).

A given outcome, caused by climate change, may also be the result of poor policies. Increasing temperatures may reduce irrigation water but groundwater shortages and lower water tables may be due to over–extraction. Reduced surface water may stem from higher temperatures but also from flow restrictions. The region has two major dam projects which will decrease river flows. The Turkish South–eastern Anatolia Project that envisages construction of 22 dams along the Tigris and Euphrates rivers which will reduce river flows to Iraq and Syria while the Grand Ethiopian Renaissance Dam will diminish the flow of the Nile, affecting Sudan and Egypt.

One of the most obvious climate change effects is the increase in average earth surface temperatures, particularly since 1980. Table 10 shows that many annual temperature records in the Arab Region were shattered in recent years. Globally, average annual land temperatures since 1750 were highest in 2016, followed by 2019 and 2017 (Berkeley Earth, 2020).

TABLE 10.
CLIMATE CHANGE EFFECTS IN THE ARAB REGION: RECORD MAXIMUM AVERAGE TEMPERATURE YEARS AND WARMING SINCE 1960

COUNTRY	THREE HIGHEST AVERAGE TEMPERATURE YEARS SINCE 1750	WARMING SINCE 1960 (°C/CENTURY)
Algeria	2010, 2016, 2014	2.86 ± 0.28
Bahrain	2018, 2010, 2015	3.13 ± 0.55
Comoros	2019, 2010, 1998	1.92 ± 0.32
Djibouti	2019, 2015, 2017	2.29 ± 0.44
Egypt	2010, 2018, 2017	2.03 ± 0.33
Iraq	2010, 2018, 2017	2.54 ± 0.45
Jordan	2010, 2018, 2016	2.10 ± 0.29
Kuwait	2010, 2018, 2017	2.86 ± 0.65
Lebanon	2010, 2018, 2016	1.97 ± 0.19
Libya	2010, 2018, 2016	2.54 ± 0.63
Mauritania	2010, 2017, 1987	2.28 ± 0.63
Morocco	2010, 2017, 2001	2.71 ± 0.23

[12] Between one–quarter and half of the population of Alexandria, Casablanca, Djibouti–Ville, and Tripoli live in informal settlements (World Bank, 2014).

TABLE 10
(CONTINUED)

COUNTRY	THREE HIGHEST AVERAGE TEMPERATURE YEARS SINCE 1750	WARMING SINCE 1960 (°C/CENTURY)
Oman	2015, 2018, 2017	2.96 ± 0.52
Palestine		1.71 ± 0.30
Qatar	2018, 2010, 2015	3.30 ± 0.49
Saudi Arabia	2010, 2018, 2017	2.58 ± 0.50
Somalia	2019, 2015, 2017	2.14 ± 0.50
Sudan	2010, 2016, 2009	2.04 ± 0.22
Syria	2010, 2018, 2016	1.95 ± 0.19
Tunisia	2014, 2016, 1999	3.12 ± 0.31
United Arab Emirates	2018, 2015, 2017	3.36 ± 0.57
Yemen	2019, 2015, 2017	2.50 ± 0.55

Note: The temperature range in column 3 indicates the 95% confidence interval.

Source: Berkeley Earth, 2020 .

Sea level rises are also well documented. Church and White (2011) estimated global mean sea levels have risen 21–24 cms since 1880, a third of the rise since 1993. Higher seas increase risks of inundation and erosion of coastal areas, as well as storm surges. One of the most vulnerable areas in the Arab Region is the Nile Delta, including the crop growing area of Alexandria and Port Said (World Bank, 2014). All coastal areas in the region are vulnerable to increased flooding as sea levels rise. Bahrain, Djibouti, Egypt, Iraq, Kuwait, Mauritania, Morocco, Qatar, Saudi Arabia, Sudan, United Arab Emirates, Yemen as well as Libya's coastal cities may see salinization of groundwater aquifers, increased flooding and seawater inundation (El Raey, 2009).

The number of natural disasters (floods, sandstorms, earthquakes, droughts) in the Middle East and North Africa Region tripled between 1980 and 2010 (World Bank, 2014). Though it is uncertain how much of the increase was due to warming temperatures, rising sea levels have increased flooding for vulnerable populations due to expanded coastal urban settlements where 17 percent of the population lives (World Bank, 2014).

Macroeconomic shocks

Macroeconomic shocks also have implications for hunger and nutrition in the Arab Region, volatile oil prices (the main export earner for many countries), food prices and fluctuating tourism revenues for countries such as Egypt and Lebanon where tourism is an important share of GDP. None of these variables is completely determined within the region, except the number of international tourist visits which changes with perceptions of the risk of violence.

Some Arab domestic prices are affected by international commodity prices, the region being largely dependent on food imports. Figure 6 shows the average wheat self–sufficiency ratio (SSR) of countries in the region in 2015–17, the import dependency ratio being the difference between 100 and the SSR.

FIGURE 6.
WHEAT PRODUCTION, NET IMPORTS AND SELF-SUFFICIENCY RATIOS IN SELECTED ARAB COUNTRIES, 2015-17
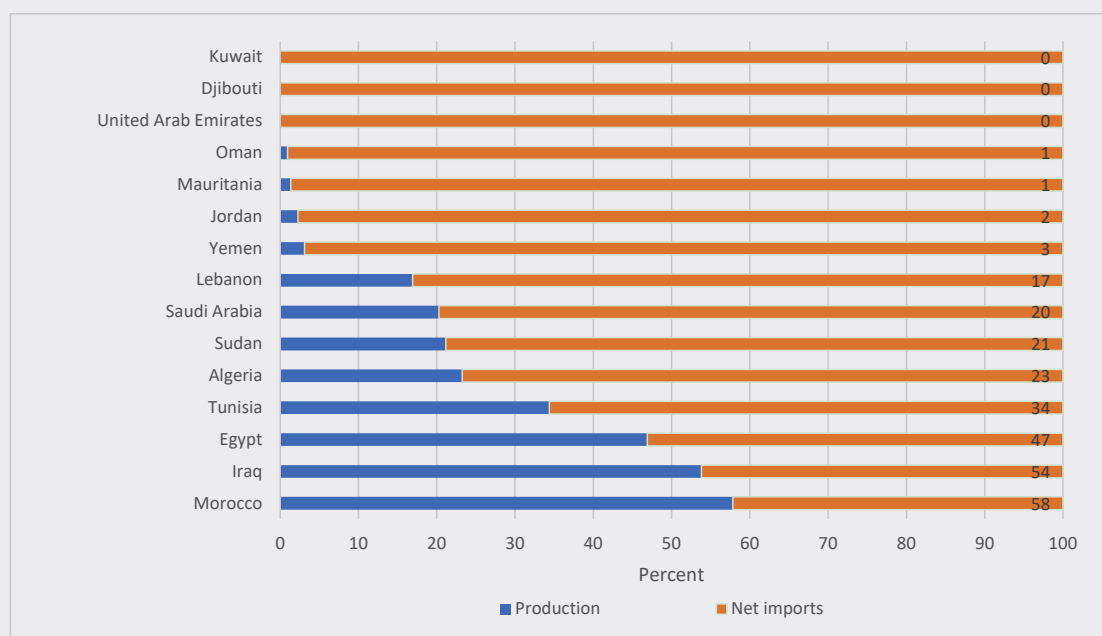
Note: The SSR is calculated as wheat production x 100/(production+imports–exports).

Source: FAO FAOSTAT, 2020.

Many Arab countries control prices for staples, such as wheat flour and bread so domestic prices do not fluctuate with international prices. The USD retail price of bread in Tunisia was constant from 2007 to 2010 and then declined, despite international wheat prices spikes (Figure 7). But in Sudan retail wheat prices rose 100 percent between 2007 and 2008 and 50 percent in 2010 (FAO GIEWS FPMA Tool, 2020).

It is uncertain international commodity price increases, even if they filter through to the poor, lead to welfare decreases as projected, based on cross–section simulation modelling in the years with price rises. Dimova (2015) and Aksoy and Isik–Dikmelik (2008) argued that the net effect of commodity price rises for the rural (as in the Arab Region) depends on whether they are net consumers or producers. Dimova (2015) showed that the bottom quintile of rural households in Côte d'Ivoire (net food producers) benefited from price increases, while rural households in the higher quintiles (net food consumers) suffered welfare decreases, just as urban consumers did. The effect on the rural poor in each country depends greatly on their net food position.

International oil prices are notoriously volatile, as shown in Figure 7. From 1960 to 2019 the variation coefficient of crude oil prices was triple that of wheat prices in the same period.

FIGURE 7.
PRICES FOR UNITED STATES OF AMERICA HARD RED WINTER WHEAT AND CRUDE OIL, REAL 2010 USD PER TONNE
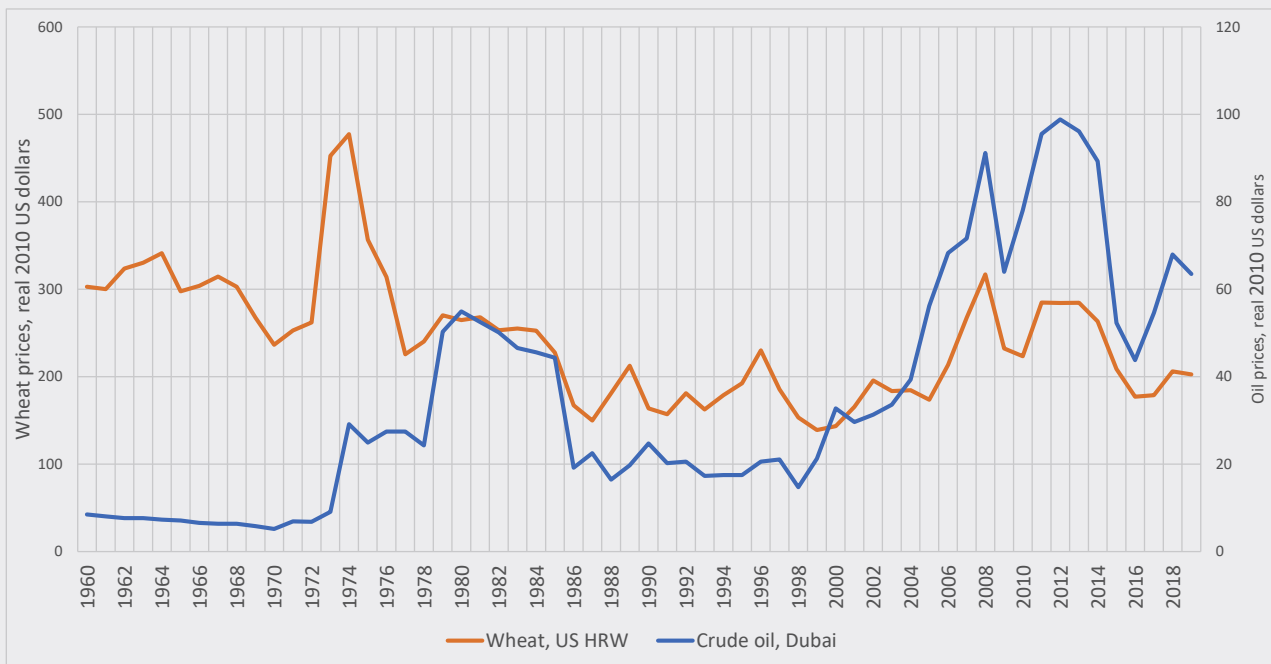
Source: World Bank commodity price data (2020).

How do fluctuating oil prices impact on livelihoods? As with food prices, countries in the Arab Region often control refined oil prices. Prices for petrol, heating oil, gas and electricity often rise when governments reduce energy subsidies, rather than from immediate market changes. In 2016 Egypt raised petrol prices to cut energy and food subsidies, float its currency, and introduce new taxes, part of an agreement with the International Monetary Fund (IMF) for a USD 12 billion loan (AP, 2019).

The impact of oil prices on livelihoods is felt more through their effect on government finances which in turn affect state expenditure, including state employees' salaries. Oil prices affect government finances because oil revenues comprise a large part of state revenues (Table 11, col. 1). The IMF estimated the price at which oil exporting countries achieve fiscal and current account balance (breakeven oil price, Table 11, cols. 2–5). A comparison of break even oil prices with Dubai oil prices in Table 11 illustrates how recent price declines have pushed many oil exporters towards fiscal and current account imbalance.

TABLE 11.
THE IMPACT OF FLUCTUATING OIL PRICES ON GOVERNMENT FINANCES IN THE ARAB REGION

	OIL SHARE OF GOVERNMENT REVENUE* (%)	BREAK EVEN OIL PRICE, USD**				DUBAI OIL PRICE, USD***		
		2019		2020 (PROJECTION)				
	2013	FISCAL	EXTERNAL	FISCAL	EXTERNAL	2013	2019	AUG–20
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Total Arab Region	71.0							
COUNTRIES								
Algeria	61.5	104.6	96.0	157.2	112.2			
Bahrain	87.5	106.3	76.5	95.6	80.8			
Egypt	5.0							
Iraq	96.5	55.7	60.7	60.4	59.1			
Kuwait	93.0	52.6	50.5	61.1	50.6			
Libya	93.5	48.5	57.4	57.9	59.1			
Oman	86.0	92.8	74.5	86.8	62.1	105.43	63.18	43.71
Qatar	40.0	44.9	56.4	39.9	37.6			
Saudi	89.0	82.6	50.1	76.1	44.2			
Sudan	18.5							
Tunisia	1.0							
United Arab Emirates	68.0	67.1	31.0	69.1	32.0			
Yemen	55.5	125.0****	145.0****					

Notes: *Oil revenue as a share of government revenue in 2013; fiscal break even price is the price at which the fiscal balance is zero. The external break even price is that at which the current account balance is zero; ***Dubai oil price is the average annual (or monthly) Dubai Fateh crude oil price in nominal USD.***For Yemen, the figures are for 2017 (125) and the period 2000–2016 (145).

Sources: Statista, 2020 (share of revenues); Data IMF.org, 2020 (break even oil prices); World Bank commodity price data, 2020 (crude oil prices, Dubai).

A third important macroeconomic shock for some countries in the Arab Region is revenue from international tourism (Table 12). The gross domestic product (GDP) share of travel and tourism revenues ranged between 9 and 19 percent for most Arab countries in 2019 (Table 12, col. 1). International tourist arrivals have been falling in recent years, but the pandemic had a devastating impact on the sector. In the first half of 2020, tourist arrivals declined by 57 percent in the Middle East and 62 percent in North Africa (OECD, 2020a). Tourism is a major source of income for many countries in the region, notably Morocco, Tunisia, Lebanon and Egypt. Egypt and Morocco are among the worst affected countries globally by GDP losses as a result of the decline in tourism. In addition to significant job losses in the travel and tourism sector, the decline in tourism also affects food consumption and demand for local, high value perishable foods, fresh vegetables, fish and dairy products sourced by hotels and restaurants, with negative impact on food producers.

TABLE 12.
TRAVEL AND TOURISM, SHARE OF GDP AND CHANGE IN INTERNATIONAL TOURIST ARRIVALS,
% OVER PREVIOUS YEAR

COUNTRY	TRAVEL AND TOURISM, SHARE OF GDP, 2019	INTERNATIONAL TOURIST ARRIVALS, % CHANGE OVER PREVIOUS YEAR		
		2017	2018	JAN–MAY 2020
Algeria	6.68	–20.2	–8.4	
Bahrain	13.39	–12.0	–5.9	
Comoros	9.89	–4.5	–28.2	
Egypt	11.99	–55.1	–37.3	
Iraq	8.41			
Jordan	19.76	–7.8	–8.0	
Kuwait	6.09	–5.0	–14.9	
Lebanon	19.47	–10.0	–5.8	–71
Libya	3.09			
Morocco	18.89	–9.8	–8.3	
Oman	9.37	0.8	0.6	–52*
Qatar	9.36	23.2	19.4	–41
Saudi Arabia	9.27	10.7	4.8	–26
Sudan	4.63	–1.6	–2.8	
Syria	11.52			
Tunisia	16.15	–23.2	–17.7	
United Arab Emirates	10.89	–7.5	–4.4	+4
Yemen	5.88			

Note: For Oman, January–June 2020.

Sources: Knoema, 2020 (travel and tourism share of GDP in 2019); World Bank WDI, 2020 (international tourist arrivals, 2017, 2018); UNWTO, 2020 (international tourist arrivals, 2020).

Covid–19 related shock

In October 2020 the IMF projected the global economy would contract by 4.4 percent in 2020 as a result of the pandemic and the deepest global recession since World War II (IMF WEO Data, 2020c; Kose and Sugawara, 2020). IMF projections for the Arab Region ranged from 3.5 percent growth in Egypt to a 67 percent fall in Libya (Table 13). A GDP decline is also determined by pre–existing economic crises such as in Lebanon and conflict as in Libya and Syria.

Covid–19 measures have affected global food security, hunger and nutrition mainly through people's livelihoods, while effects on the supply and prices of agricultural commodities and food, although disruptive, have been much less than for other commodities. Nearly all countries of the region (except Yemen) have Covid–19 stimulus packages, varying in size, affecting fiscal or monetary policies (IMF, 2020e).

TABLE 13.
IMF ESTIMATES AND PROJECTIONS FOR GDP GROWTH IN 2019, 2020 AND 2021, % GROWTH OVER PREVIOUS YEAR

	GDP GROWTH, %		
COUNTRY	**2019**	**2020**	**2021**
Algeria	0.8	−5.5	3.2
Bahrain	1.8	−4.9	2.3
Comoros	1.9	−1.8	2.9
Djibouti	7.5	−1.0	7.0
Egypt	5.6	3.5	2.8
Iraq	4.4	−12.1	2.5
Jordan	2.0	−5.0	3.4
Kuwait	0.4	−8.1	0.6
Lebanon	−6.9	−25.0	n/a
Libya	9.9	−66.7	76.0
Mauritania	5.9	−3.2	2.0
Morocco	2.2	−7.0	4.9
Oman	−0.8	−10.0	−0.5
Qatar	0.9	−12.0	8.2
Saudi Arabia	0.8	−4.5	2.5
Somalia	0.3	−5.4	3.1
Sudan	2.9	−1.5	2.9
Syria	n/a	n/a	n/a
Tunisia	−2.5	−8.4	0.8
United Arab Emirates	1.0	−7.0	4.0
Yemen	1.7	−6.6	1.3

Source: IMF WEO Data, October 2020c.

Sudden demand changes have disrupted global food supply chains (increasing demand for at–home prepared food, decreasing demand for restaurants, food service and food away from home), along with transport disruptions (travel/trade restrictions), closures of food processors (e.g. outbreaks in meat packing plants) and disruptions in services and input supplies, such as fertilizers, seeds, pesticides and other inputs, also due to travel/trade restrictions (OECD, 2020a). Global supply chains have adapted and been remarkably resilient (OECD, 2020a; Swinnen and McDermott, eds, 2020). Agricultural commodity prices have been largely unaffected apart from responding to fundamentals, while lower demand has led to a fall in the price of oil and minerals (World Bank, 2020).

Country simulations by the International Food Policy Research Institute (IFPRI) showed the main early effects of the downturn are in the

services sector, including dining and food processing, as well as migrant labour (Swinnen and McDermott, eds, 2020). The Egyptian country simulation for April–June 2020 indicated that the initial shock of Covid–19 measures impacted heavily on textile and other manufacturing, metals and machinery, trade, transport, hotel and food and other tourism services (Breisinger *et al.*, 2020). Table 16 illustrates some of the anticipated effects of Covid–19 and related measures on tourism as of June 2020. Given tourism and travel was 20 percent of Lebanon's GDP in 2019, a 71 percent fall in 2020 was likely to reduce GDP by 13 percent. In June 2020 the IMF projected a 12 percent annual GDP fall but updated its projection to –25 percent in October, due to the ongoing financial crisis and economic collapse (Table 13).

Egypt illustrates the positive effects of timely government intervention in March to curb the spread of the virus. Measures included a ban on international flights, public gatherings, the closure of schools and religious institutions and a night curfew. Many factories remained open but with reduced shifts, while Egypt avoided a full lockdown as happened in other countries. The government devised a Covid–19 stimulus programme, amounting to 1.8 percent of GDP to mitigate the economic impact and contain the spread of the disease: increased pensions, expanded cash transfers, support for informal workers, as well as consumer stimulus measures (IMF, 2020e). Breisinger *et al.*, (2020) estimated as a result the Egyptian economy would contract by only 1.1 percent in April–June 2020 as opposed to an estimated 8.7 percent.

With an average 2020 GDP fall in the region of 4.9 percent (IMF WEO data, April 2020b), Covid–19 shocks will have negative effects on livelihoods for producers and consumers. However, the unique combinations of each country's Covid–19 restrictions and stimulus programmes makes it difficult to project the overall effects on food security, hunger and nutrition. IFPRI estimates that a 5 percent fall in global GDP will result in a 20 percent increase in extreme global poverty (Swinnen and McDermott, eds, 2020). This takes into account the stimulus

measures in the United States of America and Europe but not social and economic mitigation in developing countries.

FAO (2020a) reckons the main negative impact of the Covid–19 pandemic on food security and hunger in the Arab Region is likely to be disruption to the livelihoods of vulnerable populations, particularly in countries in conflict or in a financially vulnerable position that are more susceptible to shocks. The closure of rural markets in some countries as a preventative measure to limit the spread of Covid–19 will probably lead to loss of income for many smallholder farmers and informal urban producers who traditionally sell in such markets (FAO, 2020b). These markets are a source of jobs, livelihoods and food for low income households. The actual poverty effects remain to be seen and will depend partially on the efforts of governments and donors in the region to provide support for those most vulnerable to disruption of their livelihoods from lockdown measures and from the virus.

2.2.2 What are the main stresses in the Arab food system?

The following section identifies the main food system stresses along with the impact on food system outcomes, with a focus on food and nutrition security.

Stresses associated with biophysical and environmental drivers

Land and water scarcity

There is limited arable land in the Arab Region, nearly 90 percent comprises steppes and deserts, just under half of which is too dry for extensive livestock production. The amount of farmed land per person, estimated at 58 million hectares, has fallen 6 per cent in the last 50 years due to increased unsustainable farming practices with strong population growth (FAOSTAT, 2018; ESCWA, 2017). Countries of the Gulf Cooperation Council (GCC) have the lowest

share of agricultural land (19.5 percent cropland and pastures), only 1 percent is arable cropland (OECD and FAO, 2018). Saudi Arabia and the United Arab Emirates have acquired land in other countries such as in Sudan to outsource food production.

The region's soils suffer from severe, ongoing degradation with three–quarters of its 30 million hectares of rainfed cropland estimated to be degraded (ESCWA, 2017). Water erosion is predominant in areas with sloping lands and wind erosion is another threat (ESCWA, 2017). Coastal arable plains are susceptible to seawater intrusion such as in Gaza or the Nile Delta, with desert encroachment in Sudan and the Arabian Peninsula as well as the Jordan Valley (ESCWA, 2010). Salinity has greatly reduced crop yields and causes heavy losses estimated at USD 1 billion annually, equivalent to USD 1 600 – 2 750 per hectare (ESCWA, 2017). The estimated annual cost of land degradation in the region is USD 9 billion.

The Arab Region is also one of the most water–scarce in the world. Most Arab countries cannot meet current water demand, likely to worsen due to precipitation pattern changes as a result of climate change. Some 60 percent of the region's freshwater flows across international borders, further complicating water management. About 87 million people in the region lack access to improved drinking water in their homes (ESCWA, 2020). Water and conventional energy are also strongly interdependent especially when pumping and transferring underground water, producing hydropower, or cooling thermal power plants. Agriculture uses 85 percent of water consumption with very low water productivity (AFED, 2015).

The region has the largest water consumption deficit in the world (Al–Saidi *et al.*, 2016). Beginning with Libya in the 1950s, water demand began to exceed available supply, to the point where the region essentially ran out of water (Allan, 1997). Globally, average water available per capita is close to 7 000 cubic metres per year, but in the Arab Region it is 1 200 cubic metres (Aw–Hassan *et al.*, 2014).

Climate change is projected to magnify the stress of water insecurity worldwide, as water supplies become less predictable and poorer quality (Capelli, 2017). In the region, these effects will be experienced through precipitation disruptions, such as more intense and frequent droughts and increasing temperatures (Al–Saidi *et al.*, 2016) and changes in seasonal rainfall patterns. While exogenous environmental factors, e.g. groundwater pollution from agriculture, including fertilizers and industrial and domestic activities (UNDP, 2013), are exacerbating regional water insecurity, national policies further stress resources with unsustainable groundwater extractions leading to salt water intrusion (Tropp and Jägerskog, 2006).

Stresses associated with technological and infrastructural drivers

Technological development can be a double–edged sword. It can improve resource conservation and productivity but widen inequalities, particularly if access is limited for the poor, or is not gender–sensitive, or if it creates entry barriers to a given market. It also causes significant damage if used unsustainably. Deep well drilling since the 1980s has contributed to depleted water aquifers in the Arab Region beyond the natural replenishment rate. Water saving technologies are central to agricultural water policy. Morocco, for instance, has implemented a national irrigation water saving programme since 2002 to increase efficiency by replacing flood and sprinkler irrigation systems with drip irrigation (Oudra and Talks, 2017). While digital technologies can improve food system outcomes, other investments are needed to address the infrastructure constraints farmers face such as roads, energy, post–harvest storage, and logistics to link them to markets. Policy improvements increase incentives for farmers and agribusinesses to invest in farms and across agricultural value chains which may in turn increase demand for digital technologies. New technologies and e–market linkages have allowed certain Arab countries, especially GCC states, to absorb the impact of Covid–19 lockdowns. For instance, an entrepreneur in

the United Arab Emirates introduced a mobile digital marketplace app to connect local farms to households and businesses (*Gulf News*, 2020).

Stresses associated with sociocultural drivers

A. Social inequalities

Sociocultural food system stresses are evident in persistent power and economic inequalities such as between men and women as well as social classes and nations. In the Arab Region, unequal male land ownership is one example and the neglect of migrant workers' rights, especially in time of health crisis such as Covid–19, is another. Migrants working under informal or irregular arrangements play a significant role in agrifood systems. In most cases they endure poor housing and working conditions, with no access to health care or social protection (FAO, 2020). Confinement due to Covid–19 measures have also meant loss of income. Migrant workers' families face reduced purchasing power due to the lower remittances they need to buy food with curtailed access to healthy diets (FAO *et al.,* 2020 b).

B. Gender inequality

Sustainable food systems cannot be achieved without gender equality (FAO, IFAD, WFP, 2020). While accessing food is normally an economic issue, gender inequality is also a driver in unequal food security outcomes as the United Nations Development Fund for Women (UNIFEM) estimates "7 out of 10 of the world's hungry are women and girls" (Badr, 2010). Women globally are more likely to be food insecure than men, magnified in rural areas (FAO, 2020a). Globally, women comprise a disproportionally small share of all landowners, and they own a smaller share of all agricultural land than men (FAO, CGIAR, 2018). Wealth inequality is not limited to land ownership, as women have much less access to credit, making them more susceptible to hunger in times of crisis (Botreau and Cohen, 2019). The claim that women do half the farm labour may be a serious underestimate, especially in the Middle East and North Africa (MENA) region,

where most women's work is unpaid, rendering it essentially invisible (El–Fattal, 1998). In addition to low pay, women in agriculture are more likely to work longer hours, with seasonal contracts, owing to the work they do in the home (Badr, 2010). In the region, women's land ownership is complicated by law and traditions, and when they do own land, a male member of the household often controls it. About 75 percent of the illiterate adult population in the Arab Region are women, making it difficult for them to defend their property rights (Badr, 2010).

There are serious gender disparities in food systems' outcomes. Malnutrition and overweight/ obesity illustrate this, with obesity prevalence among women being more than double in Egypt alone (Alebshehy *et al.,* 2016). As shown in Part 1, the incidence of anaemia in women of childbearing age is a moderate to severe public health problem across the countries of the region. In part this has to do with diets and changing lifestyles, but also vulnerability, precarity, gender–based violence (GBV), not having an income, for example, or being stopped from partaking in physical activity. Public policy has yet to respond adequately (Sibai *et al.,* 2003; Batnitzky, 2008; Yount and Li, 2011).

Stresses associated with political and institutional drivers

The Arab Region has been mired in conflicts, unrest and wars for the best part of 100 years. The Arab Spring of 2011 was a turning moment for political stability and the conflicts that contributed to shaping the region over the last decade, such as the wars in Iraq, Syria, and Yemen, can be traced back to that movement. The wave of instability and conflicts has added significant stress to food systems, their effects manifesting in several ways, perhaps the most visible being the massive wave of forced migration, both internally and between countries. The food security status of Syrian refugees in Lebanon and Jordan is low, as in 2020, 5 million Syrians were dependent on aid from the United Nations World Food Programme (WFP and FAO, 2020). The influx of refugees into

Jordan and Lebanon since 2012 has also strained the capacities of local food systems, and FAO has reported increased pressure on already limited Lebanese water resources. Lebanese workers, who had shown little interest in agricultural employment, now compete with Syrian migrants for agricultural jobs, increasing rural unemployment and poverty and obstructing food access (FAO, 2020b). Elsewhere in the region, in south Yemen 29.8 million people were reported to be acutely food insecure in 2020 (FSIN & *Global* Network Against *Food Crises*, 2020), the impact of violence being a key driver, alongside other pre–existing socioeconomic conditions (ACAPS, 2019).

Stresses associated with economic and market drivers

A. Dependence on food imports

While imports can enhance the resilience of a food system through favourable prices and diverse trade partners, import dependency is a major limiting factor for Arab countries. This is due to a variety of reasons, such as scarcity of hard currency in low–income countries, but more commonly the risk of embargos, sanctions or blockades. This is understandable given the volatile geopolitical environment and frequent conflicts which have a strong negative impact on food security. The Arab Region's imports of food and animal products have been growing since the 2000s, reaching over USD 90 billion in 2013, the latest trade data available from the FAOSTAT database. The Arab Region is the largest cereals importer in the world (Woertz, 2017) and while some have advocated for increased self–sufficiency in staple food items, many view import dependency as a natural feature given environmental constraints and growing populations (Sadler and Magnan, 2011). This is especially relevant as increasing production via irrigated farming can stress fragile soil and water resources and further decrease sustainability. In most countries, import dependency is associated with limited natural resources which do not permit further expansion of arable land. Regardless of the extent to which the region can

further develop agriculture, it remains highly vulnerable to global food market fluctuations, such as the 2008 price spikes.

B. Food subsidies associated with dependence on oil revenues

In many Arab countries, food subsidies play an important economic, and indeed, political role (Woertz, 2017). Given the fiscal burden of these subsidies (up to 31 percent of the Egyptian budget, for instance), the IMF and World Bank have advocated replacing them with more targeted assistance. These subsidies are unsustainable being tied historically to oil price fluctuations. When oil prices shot up in the 1970s, countries vastly expanded food subsidies, though when the effects of the boom faded, countries like Syria and Egypt responded by rolling back certain subsidies in the name of economic liberalization (Woertz, 2017). Algeria depends on petroleum and natural gas exports but due to the international decline in the oil sector, its economy contracted by 3.9 percent in the first quarter of 2020 after growth of 0.8 percent in 2019 and the government then reduced wheat subsidies (FAO GIEWS, 2020)

Dependence on oil for state revenues is also a concern in wealthier countries like Saudi Arabia. In the wake of volatile oil prices in 2014, Alsweilem (2015) identified a pressing need for "decoupling spending from oil revenue" and characterized increased food subsidies as a "rising long–term spending pressure". The Covid–19 pandemic and restrictions caused a global contraction in economic activity and a collapse in demand for oil products (OECD, 2020a), placing enormous fiscal pressures on Gulf governments. Saudi Arabia tripled its value added tax rate while removing allowances for public sector employees to maintain the dollar peg so crucial to the nation's export economy (Bostock, 2020).

Stresses associated with demographic drivers

A. Rapid population growth and migration

The Arab Region has 436.4 million inhabitants, up from 222.7 million in 1990 (UNDESA, 2019). Rapid population growth means food demand will grow significantly, something most Arab countries will find hard to meet given the region's shortage of arable land, exacerbated by increased urbanization and land degradation (ESCWA, 2017).

Although migration is traditional to many countries in the Arab Region, especially in North Africa and the Mashreq, conflicts and crises exacerbate it. The origins of the Lebanese diaspora go back to two very significant waves: one around the great Syrian famine during World War One and the other during the Lebanese civil war in the last quarter of the 20th century. Poorer countries and those with prolonged conflict and economic crises have recently had considerable migration to Europe and richer countries of the region, especially the GCC states. The escalation of Syria's conflict has displaced 6.6 million people by the end of 2019 worldwide, predominantly to Turkey, Lebanon, Jordan, Iraq and Egypt (UNHCR, 2020). These are likely to be underestimates as the UNHCR only accounts for registered refugees.

B. Urbanization and shifting diets

The relationship between urbanization and diets is complex, involving changes in income, lifestyle and culture, greater diet diversity, the opportunity cost of time spent cooking, and the year–round availability of certain foods (Seto and Ramankutty, 2016). WHO (2003) identified urbanization, increasing in the Arab Region and a key driver of demand for animal protein, as improved urban infrastructure allows for cold chain development. Urbanization is also associated with increased consumption of processed and pre–prepared foods, often

cheap fast food, because of longer work hours (Satterthwaite *et al.*, 2010). Combined with low physical activity among the urban population, the diet of the average Arab citizen, consisting largely of cereals, sugar and oil (ESCWA, 2017) results in increased overweight/obesity and related NCDs (Sibai *et al.*, 2010). Among other factors, such as subsidies and affordability of healthy diets, this explains why more than a quarter of the Arab population is obese and why the region ranks second in the world for obesity (see Table 7 in Part 1).

Urbanization in the Arab Region is associated with "a shift away from traditional, seasonal, and more diverse diets rich in whole grains, fruits, and vegetables" (Bahn *et al.*, 2019). A great number of Arab consumers are changing to a diet rich in refined cereals, fats, sugars and when income permits, more animal protein. The latter can bring nutritional benefits such as increased absorption of vitamin A, zinc, and iron (WHO, 2003) for those suffering from deficiencies, such as children, particularly in conflict countries (see Table 6). But excessive red meat, particularly processed meat, exposes consumers to a variety of health risks. Studies show long term overconsumption of red meat, particularly processed meat, is associated with increased risk of mortality, cardiovascular disease, colorectal cancer and type 2 diabetes, in both men and women (Battaglia–Richi *et al.*, 2015).

Diet shifts have negative effects on the environment in terms of biodiversity loss, GHG emissions and water use, as the amount of water needed to produce animal–based foods is greater than for plant–based foods (Bahn *et al.*, 2019).

Reflecting global trends, research suggests healthier diets will reduce health risks and lessen the severity of the environmental footprint of food production by reducing water usage and GHG emissions (Willet *et al.*, 2019). However, affordability is an issue, explored in more detail in section 2.3.2.

2.3. ANALYSIS OF MAJOR VULNERABILITIES AND RESILIENCE CAPACITIES OF FOOD SYSTEMS

When affected by a disturbance a vulnerable food system lacks resilience and cannot deliver the same outcomes. Vulnerability largely depends on the fragility of one or more of a system's components, although Turner *et al.,* (2003) warn against addressing components or outcomes separately, as its functioning depends on interactions between them. When one component fails the impact is likely to reverberate right through the system.

There is a wide range of conditions and vulnerabilities in the Arab Region, many dependant on the natural endowment, socio–political situation and economic entitlement with some general shared food system features, for example arid or semi–arid locations. The analysis below focuses on shared vulnerabilities of different food systems while underscoring intercountry differences. The emphasis is on vulnerabilities from the failure of the Arab food system to provide food security through affordable healthy diets, security being the normative outcome of the food system, while acknowledging three other outcomes: environmental, social and economic.

All components of food systems in the Arab Region are vulnerable to various shocks and stresses as discussed. The following sections present the evidence on how shocks and stresses affect food system components.

2.3.1 Impact of shocks and stresses on Arab food supply chains

Agricultural production systems

Agriculture systems are highly vulnerable to shocks such as water scarcity and climate change. The Arab Region's highland mixed farming system employs most agricultural labour and relies heavily on rainfall, seventy percent of agriculture being rainfed (Dixon *et al.,* 2001). Syria suffers from persistent dry spells while countries such as Morocco, Algeria or Tunisia are expected to become "global hot spots for drought by the end of the twenty–first century" (Waha *et al.,* 2017; FAO GIEWS, 2019). In addition to environmental stress, production is affected by policies such as fuel subsidies which cut the costs of pumping groundwater from deep wells, thereby increasing long–term costs for the entire food system.

Smallholder farmers face significant environmental, economic, and political challenges. They are vulnerable to climate change due to small farm size, low technology use and financial stresses, as well as low productivity and weak market participation from fragmented production, weak organization and limited service access (Morton, 2007; Otto *et al.,* 2017). Shocks such as increased debt liability after a poor harvest force many smallholders to diversify production which can be positive as regards nutritional diversity and greater resilience but can also lead to lower productivity (OECD and FAO, 2018). Government policies favouring larger farms have contributed to deteriorating rural livelihoods. In Tunisia, reduced producer subsidies and lack of access to credit by small and medium farms leads to impoverished rural communities, causing a substantial rural exodus between 1999–2004 (Jouili, 2009). Rolling back agricultural support schemes in Syria made smallholders vulnerable to severe droughts between 2006 and 2010 and intensified urban migration (Woertz, 2017). Poor resource management has resulted in weak and badly implemented land and water projects, combined with inadequate smallholder rights, making them more vulnerable to water scarcity (Williams, 2015). Fragmented holdings compound land access difficulties (Dixon *et al.,* 2001) and, as a

result, much of the poverty in the Arab Region is rural. For example, 75 percent of the poor in Egypt, Sudan or Yemen, live in rural areas (ESCWA, 2017).

Trade: imports and exports

Trade plays a key role in food security in the Arab Region, though several factors weaken it, including economic conditions and political instability. The region is a net food importer and factors that disrupt trade flows threaten food system resilience and diminish food security and nutrition outcomes. Conflicts and their spillovers block food imports. In GCC countries 81 percent of rice imports pass through chokepoints such as the Straits of Hormuz and Bab Al–Mandab on the Red Sea. Currently there is free flow of goods but trade disruption due to the war in Yemen or the danger of a conflict between the United States of America and Iran in 2019, revealed the vulnerability of heavy import reliance, even for wealthy countries in the Arabian Gulf (Kandeel, 2019).

Wheat plays a crucial role in Egyptians' diets, providing one–third of their calories and 45 percent of their protein (Veninga and Ihle, 2018). The country imports half its wheat making it the largest importer in the world and the effects of political instability following the Arab Spring exposed the vulnerability of its wheat trade. The 2008 food crisis followed by the Egyptian uprising underscored the relationship between food trade, especially wheat, and political stability. When the Covid–19 pandemic started, Egypt increased wheat purchases and its reserves, diversifying suppliers, reducing the impact of disturbances on the food system.

Shocks can also threaten the flow of food outside countries, curbing regional and international trade and affecting export earnings and hard currency flow. Limited exports and reduced trade can also cause loss of livelihoods for farmers and other workers in the agrifood chain, threatening their food security. Food makes up more than 20 percent of exports for six countries, Lebanon, Mauritania, Palestine, Morocco, Egypt and Jordan, mainly from a

limited number of high value perishable products such as fruits, vegetables, fish and meat. Measures associated with shocks such as the Covid–19 pandemic and labour shortages may limit these commodities due to labour shortages (FAO, 2020a). Countries with food security and nutrition challenges where only a sector of the population can afford a healthy diet, often export the main ingredients of a healthy diet (fruits, vegetables and fish) and import refined cereals, fats and sugar, core ingredients for unhealthy diets. Food calories may be broadly available in the Arab Region, but access to nutritious food is difficult.

Food loss and waste

The Arab Region has a generally poor record on food loss and waste. To support high productivity agriculture to feed its growing population, Arab countries rely heavily on imports and subsidized food. Yet, food is wasted at restaurants, caterers, cafeterias and especially by households, making it the single largest component of landfill. Saudi Arabia's volume of end–user food waste, retail and household, is considerable with 427 kg of food waste per capita per year, the country ranking among the top food wasters (Baig et al., 2019)food waste is one of the prime issues threatening food security and the Kingdom of Saudi Arabia (KSA. The United Arab Emirates have significant pre–market food losses as well as waste at the end–user stage. Other countries are stepping up efforts to reduce food waste. Egypt has launched a smartcard system, covering nearly 80 percent of the population, to limit the maximum amount of subsidized bread each family member can buy, resulting in a significant drop in the number of discarded loaves. In 2018, Jordan replaced its bread subsidy programme with targeted assistance, paid through an electronic transfer card and valid only for Arabic bread, to reduce public spending and food waste (FAO GIEWS, 2019). A number of countries including Lebanon, Oman and the United Arab Emirates, are using AI (artificial intelligence) and digital platforms to reduce food waste, but the efforts are still at pilot stage (Guantario, 2019).

2.3.2 Impact of shocks and stresses on the Arab food environment

Availability and affordability

With some exceptions, the Arab Region performs well on the availability pillar of food security. The average daily calorie intake per person, including losses and waste, is currently estimated at 3 000 calories, projected to reach 3 100 calories by 2030 with differences between subregions likely to continue. The GCC subregion will continue to have the highest food availability, as high as 3 600 calories per capita per day in 2030 (ESCWA, 2017). However, while excess calories are available, Arab food security and nutrition indicators, especially related to PoU, FIES, obesity and micronutrient deficiency in women, continue their negative trend. One reason is the large disparity between Arab countries, which include some of the highest and lowest income nations in the world, Qatar being one of the richest and Yemen and Comoros among the poorest. Another is the issue of conflict and acute crises, covering one–third of the countries. A third issue lies in the widespread inequalities within countries, along gender lines, social classes and between rural and urban areas. Although many Arab countries have poverty alleviation strategies, poverty and food insecurity are expected to continue rising as national incomes shrink from the effect of Covid–19 measures and the fall in the price of oil.

The affordability dimension of food systems in most countries is vulnerable to shocks. In spite of food subsidies, international price spikes in the period 2007–08 translated into food inflation of at least 20 percent in every Arab country except Morocco. Inflation, along with youth unemployment, were the major reasons for the Arab Spring protests, highlighting a causality between food affordability and political instability. The depreciation of the Lebanese lira by over 80 percent in less than a year due to the collapse of the economy raised the price of bread for the first time in eight years, with food inflation hitting 200 percent (Abadi *et al.*, 2020; Cheeseman, 2020). The following section examines the impact of affordability on diet quality in the Arab Region to explain inequalities in food security and nutrition across the region and the discussion on sustainability.

Affordability of healthy diets in the Arab Region

Diet quality, determined by combinations of regularly consumed foods, is a critical link between food security and nutrition outcomes. Supporting healthy diets should be integral to all actions to end hunger, achieve food security and improve nutrition by 2030.

Drawing heavily on the methodology (Box 4) and narratives in *The State of Food Security and Nutrition in the World* (FAO *et al.*, 2020), the cost and affordability of three levels of diet quality – an energy sufficient, nutrient adequate and healthy diet is examined[13]. It also analyses the hidden costs of dietary patterns, i.e. the health and environmental costs of consumption patterns relating to SDG 3 and SDG 13. It is important to account for these to avoid underestimating the cost of achieving food security and nutrition, and to identify potential trade–offs and synergies for achieving the other two SDGs, environmental sustainability and health for all.

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[13] The State of Food Security and Nutrition in the World 2020 defines three levels of diets: An "energy sufficient diet" provides adequate calories for energy balance (2 329 kcal, required for a reference group represented by an adult woman of reproductive age) for work each day through consumption of only the basic starchy staple for a given country (e.g. maize, wheat or rice). A "nutrient adequate diet" provides adequate calories (as per the energy sufficient diet), but also relevant nutrient intake values of 23 macro and micronutrients through a balanced mix of carbohydrates, protein, fat, essential vitamins and minerals to prevent deficiencies and avoid toxicity. A "healthy diet" provides adequate calories and nutrients (as per energy sufficient and nutrient adequate diets), but also a more diverse intake of foods from several different food groups. This diet meets all nutrient intake requirements and helps prevent malnutrition in all its forms, including diet-related NCDs.

BOX 4.
METHODOLOGY FOR ESTIMATING THE COST OF HEALTHY DIETS

Healthy diets reflect global guidelines and include foods from several groups and diversity within food groups. In the Arab Region only five countries have defined their own food-based dietary guidelines (FBDGs): Lebanon, Oman, Qatar, Saudi Arabia and the United Arab Emirates. Most available country FBDGs are not quantifiable and so it was not possible to apply country specific FBDGs to estimate the cost of a healthy diet.

Country and regional costs of healthy diets are derived from ten national FBDGs that report recommended food quantities for each food group: Argentina, Benin, China, India, Jamaica, Malta, Netherlands, Oman, United States of America and Viet Nam. While national FBDGs are country-specific, in most cases food group definitions for a healthy diet are broadly similar, consisting of 5–6 common food groups. An average of ten different costs corresponding to the ten different FBDGs provide a country-level final cost of a healthy diet.

Source: FAO, IFAD, UNICEF, WFP and WHO, 2020.

The analysis shows that accessing healthy diets in the region is a great challenge given current cost and unaffordability. The average cost of a healthy diet is equivalent to USD 4.02 PPPD (per person per day), 77 percent more than a nutrient adequate diet (USD 2.27 PPPD) and around five times higher than diets that only meet dietary energy needs through a starchy staple (USD 0.77). Across all country income groups in the region the cost of a diet rises as the quality increases – from a basic energy sufficient diet to a nutrient adequate diet and then to a healthy diet. Interestingly, the cost of a healthy diet is highest in a low–income country such as Comoros (USD 5.4) whereas it is lowest in Morocco in the lower middle–income country group (USD 2.85). See Table A.2 in the Annex for cost estimates of three diets by countries in the Arab Region.

The average cost of a healthy diet in the region is more than double the international poverty line, established at USD 1.90 PPP (purchasing power parity) per day. The average cost of an adequate diet exceeds USD 1.90 in most states, the exceptions include Jordan, Kuwait, Oman,

Qatar, Tunisia, Saudi Arabia, the United Arab Emirates and West Bank and Gaza where they are lower, in the range USD 1.1 to USD 1.8. Not only are healthy diets beyond the reach of those in poverty or just above the poverty line but most cannot even afford diets that meet requirements for essential nutrients. This is especially a concern since household food spending must be balanced against other costs, such as health care, education or housing.

The analysis shows healthy diets are unaffordable for over 50 percent of the region's population[14] (Table 14), higher than the world average of 38 percent. More than a quarter (26 percent) of the Arab Region's population cannot afford a diet that meets only required levels of essential nutrients. The challenges are greater for countries in protracted crisis[15] (Djibouti, Mauritania and Sudan), as well as Comoros and Egypt where over three–quarters (77 percent) cannot afford a healthy diet. Nearly one–quarter (24 percent) who cannot afford a healthy diet live in LDCs (least developed countries).[16]

[14] Percentages of people who cannot afford healthy diets are expressed as simple averages across countries.
[15] FAO currently identifies six Arab states in protracted crisis but information on cost and affordability is not available for three of them, Somalia, Syria and Yemen (see FAO, IFAD, UNICEF, WFP and WHO, 2020).
[16] LDC estimates include data from Comoros, Djibouti, Mauritania and Sudan.

TABLE 14.
AFFORDABILITY OF THREE REFERENCE DIETS IN THE ARAB STATES, 2017

	% OF PEOPLE WHO CANNOT AFFORD AN ENERGY SUFFICIENT DIET	% OF PEOPLE WHO CANNOT AFFORD A NUTRIENT ADEQUATE DIET	% OF PEOPLE WHO CANNOT AFFORD A HEALTHY DIET
TOTAL ARAB REGION	**2.4**	**26.5**	**50.9**
COUNTRIES			
Algeria	0.1	2.0	27.9
Bahrain	n.d.	n.d.	n.d.
Comoros	13.0	58.3	76.5
Djibouti	3.2	38.1	68.3
Egypt	0.0	45.4	84.8
Iraq	0.7	13.9	59.7
Jordan	0.0	0.9	30.5
Kuwait	n.d.	n.d.	n.d.
Lebanon	n.d.	n.d.	n.d.
Libya	n.d.	n.d.	n.d.
Mauritania	1.7	33.2	70.3
Morocco	0.0	4.1	13.1
Oman	n.d.	n.d.	n.d.
Qatar	n.d.	n.d.	n.d.
Saudi Arabia	n.d.	n.d.	n.d.
Somalia	n.d.	n.d.	n.d.
Sudan	6.8	93.4	89.0
Syria	n.d.	n.d.	n.d.
Tunisia	0.0	0.9	15.3
United Arab Emirates	n.d.	n.d.	n.d.
West Bank and Gaza	0.7	1.7	24.5
Yemen	n.d.	n.d.	n.d.

Note: n.d.= No data. The analysis does not include GCC countries or Libya, Somalia and Yemen.

Diet is considered unaffordable when its cost exceeds 63 percent of estimated income distribution in a given country. The 63 percent is the portion of income that can be credibly reserved for food. For more details on the methodology to estimate diet affordability see Annex 3 of State of Food Security and Nutrition in the World, 2020.

All types of diets, those that that meet only dietary energy needs, nutrient adequate diets or healthy diets, have hidden costs. Two hidden costs of dietary patterns and food systems are health and climate.[17] These were estimated for five dietary patterns: one benchmark diet, representing current food consumption and four alternative healthy diets that embrace environmental sustainability (Box 5). The health and environmental costs are related to a dietary shift from national average food consumption to healthy diets. The focus is on GHG emissions, the major climate change driver. The report does not aim to endorse any particular dietary

pattern in the region. While there is a range of healthy diets, based on global guidelines, that may include sustainability considerations, not all are the most healthy or appropriate diets for all population groups. For example, purely plant–based diets can carry large nutrition risks where micronutrients may not easily be supplied or managed through an abundance of nutrient–rich plant–based foods. This is the case for young children and pregnant or lactating women who have higher nutrient requirements; or where populations are already suffering nutrient deficiencies.

BOX 5.
AN APPROACH TO ESTIMATING HIDDEN HEALTH AND ENVIRONMENTAL COSTS OF DIET PATTERNS

Hidden health and environmental costs of diets are estimated for current consumption patterns and four healthy diets developed by EAT-Lancet Commission on Healthy Diets from Sustainable Food Systems. 1. A flexitarian diet contains small to moderate animal source foods. 2 A pescatarian diet includes moderate amounts of fish but no meat. 3. A vegetarian diet is primarily plant-based that excludes fish or meat but includes moderate amounts of dairy and eggs. 4. A vegan diet is completely plant-based consisting of fruits and vegetables, whole grains and plant protein sources such as legumes and nuts.

These four healthy diet patterns were examined to estimate their hidden costs since they embrace environmental sustainability. The Overview does not endorse any dietary pattern for the region.

For national average food consumption, the Overview uses as a proxy 2010 food availability estimates from FAO FBS after applying data on food wastage. (See Annex 7, FAO, IFAD, UNICEF, WFP and WHO, 2020.)

The health–related hidden cost: The 2019 Regional Overview (FAO RNE *et al*, 2020) noted a fall in mortality over three decades from communicable, maternal, neonatal, and nutritional diseases whereas

that from NCDs remained more or less constant. Premature death and disability from NCDs were associated with dietary and metabolic risks.

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[17] The analysis of hidden costs included the following Arab countries/territories: a) 15 Arab countries/ territories for hidden health costs, Algeria, Djibouti, Egypt, Iraq, Jordan, Lebanon, Libya, Mauritania, Morocco, Saudi Arabia, Sudan, Syria, Tunisia, Yemen and the rest of the Arab Peninsula; b) 17 countries/ territories for hidden environmental costs, Algeria, Djibouti, Egypt, Iraq, Jordan, Lebanon, Libya, Mauritania, Morocco, Saudi Arabia, Sudan, Somalia, Syria, Tunisia, West Bank and Gaza, Yemen and the rest of the Arab Peninsula that includes all countries on the Peninsula that were not analyzed separately.

The analysis shows that if current food consumption patterns remain unchanged, diet–related health costs[18] linked to NCDs (coronary heart disease, stroke, cancer and type 2 diabetes mellitus) will exceed USD 36 billion per year by 2030. Shifting to any of the four alternative healthy diets will lead to a reduction of 96 percent in health costs. The reduction in health costs for a vegan diet is 98.6 percent, 97.4 percent for a pescatarian diet, 94.9 percent for a vegetarian diet and 93.9 percent for a flexitarian diet (Figure 8). Shifting to healthy diets could make significant savings to be invested in lowering the cost of nutritious foods.

FIGURE 8.
HEALTH COSTS OF VARIOUS DIETS IN THE ARAB REGION
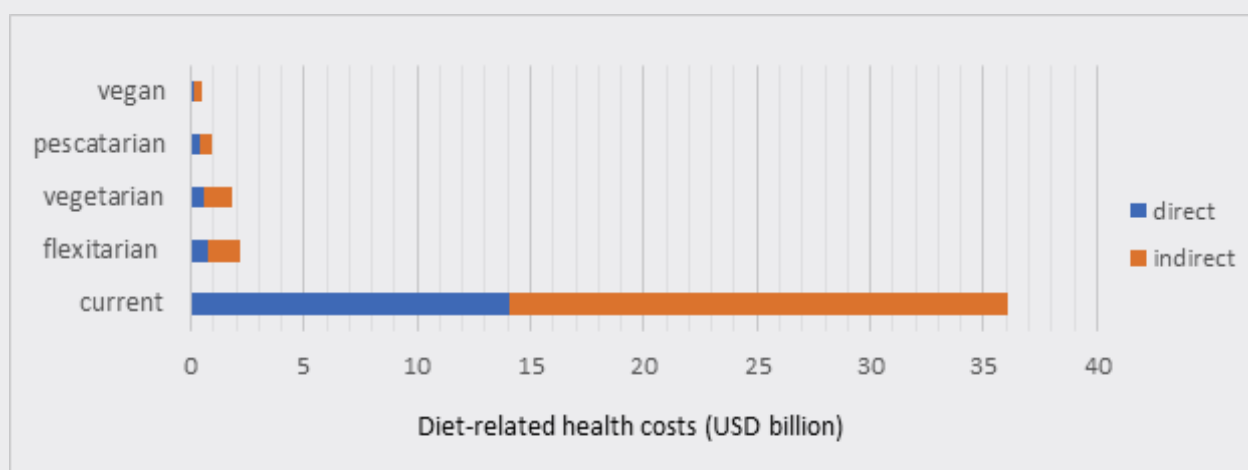
The hidden environmental cost: The climate change costs of alternative diets use estimates of the social cost of carbon and the economic cost resulting from each additional tonne of GHG emissions. If food consumption remains unchanged, projected diet–related GHG emissions (adjusted for income and population changes) will be 510.94 MtCO2–eq in 2030.[19] Three countries make up around half of total GHG emissions (51 percent), the most populous countries, Sudan (21 percent), Egypt (16 percent) and Algeria (14 percent). About 75 percent of diet–related GHG emissions relate to animal source foods, beef, milk and lamb. Adopting any of the healthy diet patterns will result in a 37–77 percent reduction in GHG emissions.

Diet–related social costs of GHG emissions are projected to exceed USD 104 billion per year by 2030. Healthy diets that include sustainability will reduce the cost by an estimated 34–74 percent in 2030 (Figure 9). As expected in

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[18] Total health costs include: direct medical and health care costs of treating a specific disease and indirect costs related to loss of working days and informal care for a specific disease.

[19] The estimates are based on data from 17 Arab countries/ territories (see footnote 5) adjusted for income and population changes. MTCO2 Eq are metric tonnes of carbon dioxide equivalent, comparing emissions from different GHGs that contribute to global warming.

countries with high GHG emissions projections of annual environmental costs of current diets by 2030 are highest in the region: Sudan (USD 21.7 billion), Egypt (USD 16.9 billion) and Algeria (USD 14.9 billion). The lowest are in Djibouti and West Bank and Gaza (USD 0.2 billion and

USD 0.9 billion respectively). However, when analysing projections on a per capita basis by 2030, projections are highest in two LDCs: Somalia (USD 0.52 billion) and Mauritania (USD 0.42 billion).

FIGURE 9.
PREDICTED REDUCTION BY 2030 IN THE SOCIAL COST OF GHG EMISSIONS FROM THE ADOPTION OF PLANT-BASED DIETS
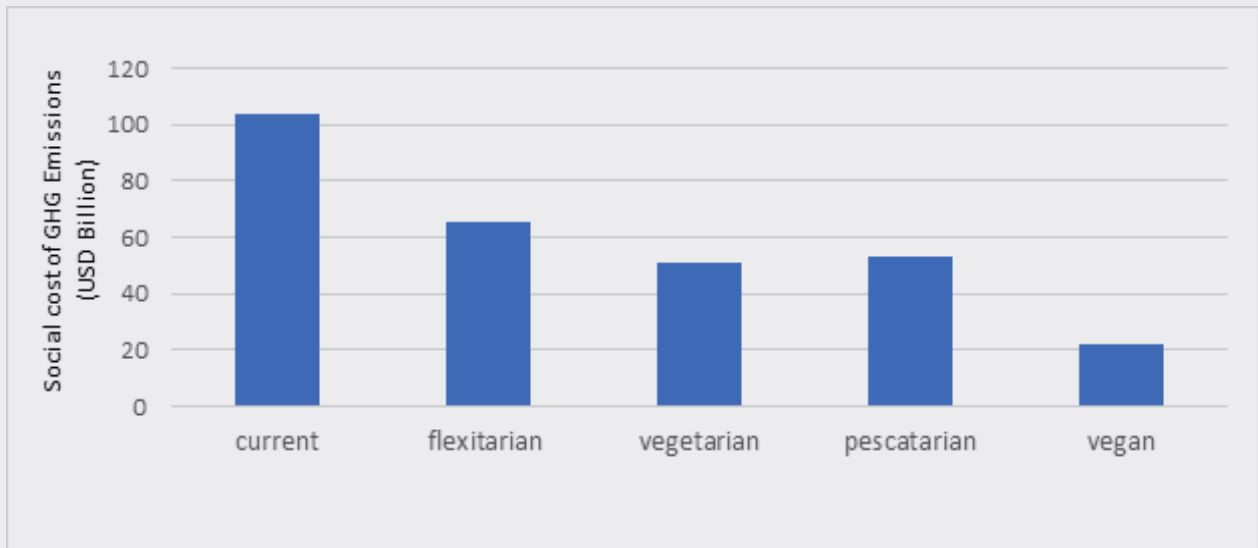
Adding hidden health and climate−change costs of current diets will increase the full cost in the region by 40 percent, from USD 346 to USD 486 billion by 2030 (Table 15). Even without hidden costs healthy diets are generally more expensive but when comparing the full costs of current diets

and four alternative diets, current diets are on average 20 percent more expensive.[20] An estimate of the full cost of diets can support policy decisions to promote sustainable healthy diets.

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[20] For the Arab Region projections of annual costs of four alternative diets with hidden health and climate change costs by 2030 are as follows: flexitarian USD 404.2 billion; pescatarian USD 402.9 billion; vegetarian USD 379.6 billion; vegan USD 370.5 billion.

TABLE 15.
PROJECTIONS OF THE ANNUAL COST OF CURRENT DIETS IN THE ARAB REGION BY 2030, USD BILLION

	THE COST OF CURRENT DIETS WITHOUT HIDDEN COSTS	THE COST OF CURRENT DIETS WITH HIDDEN HEALTH AND ENVIRONMENTAL COSTS
Total Arab Region	346.38	486.54
COUNTRIES		
Algeria	29.62	48.93
Djibouti	0.50	0.73
Egypt	78.31	102.83
Iraq	19.96	28.02
Jordan	7.10	9.80
Lebanon	5.05	7.00
Lybia	6.67	9.34
Morocco	29.96	38.70
Mauritania	2.55	4.74
Rest of Arab Peninsula	23.29	33.58
Saudi Arabia	27.78	42.42
Sudan	54.33	76.91
Somalia	5.56	12.40
Syria	21.96	28.62
Tunisia	17.89	21.91
West Bank and Gaza	4.58	5.51
Yemen	11.26	15.10

The high cost and unaffordability of healthy diets is associated with increasing food insecurity and malnutrition. As highlighted in section 2.1, a sustainable food system provides food security and nutrition from healthy and affordable diets without detrimental environmental impact. Analysis of current diets suggests that food systems in the region are neither healthy nor sustainable, confirmed by Béné *et al.*, (2020) who assessed sustainability for 97 countries, including 10 Arab countries. The results showed Arab countries perform very poorly on food sustainability, with Jordan as the worst performer of those 97 countries.[21]

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[21] The study was based on 20 indicators representing 25 domains associated with food system outcomes. These covered food security and nutrition as well as economic, environmental and social dimensions. They were combined into a food system sustainability score ranging from 0–1 (0 = worst). Only 10 of 22 Arab countries with available data were included in the study.

TABLE 16.
SUSTAINABILITY SCORES FOR 10 ARAB COUNTRIES PLUS NEW ZEALAND AND THE UNITED STATES OF AMERICA

COUNTRIES	CODES	SCORES
New Zealand	NZL	0.73
United States	USA	0.70
Kuwait	KWT	0.57
United Arab Emirates	ARE	0.52
Tunisia	TUN	0.38
Saudi Arabia	SAU	0.38
Morocco	MAR	0.38
Egypt	EGY	0.32
Sudan	SDN	0.31
Algeria	DZA	0.31
Yemen	YEM	0.31
Jordan	JOR	0.26

Note: Scores are 0–1 with 0 being the lowest.

Source: Bené *et al.*, 2020.

As the hidden costs of healthy diets that include sustainability are lower compared to food consumption, supporting them could contribute to reduced health and climate change costs by 2030. This requires urgent action to deliver healthy diets for all as envisaged in the UN Decade of Action on Nutrition.

Food safety

The Arab Region has the third highest estimated prevalence of foodborne diseases after Africa and South–east Asia (Todd, 2017). Data are scant due to limited outbreak surveillance which records less than 1 percent of actual outbreaks, but Todd (2017) estimates 3 000 fatalities annually due to foodborne illnesses in the Middle East (Arab Region plus Turkey and Iran). The most common, making up 70 percent of cases, are diarrheal diseases caused by E. coli, norovirus,

Campylobacter and nontyphoidal Salmonella, exacerbated by conflicts and displacement, as the author contends the incidence of foodborne illnesses is higher among refugees. The widespread indiscriminate use of fertilizers, antibiotics and pesticides, coupled with greater industrial pollution and increasing use of untreated wastewater in agriculture increases the likelihood of foodborne illness (Faour–Klingbeil & Todd, 2018). Poor food safety in the Arab Region is a result of weak environmental policy, which exacerbates water scarcity. In a recently published study on Lebanon for 2015–17, water contamination (55 percent of tested samples), red meat (34.4 percent), poultry (30.9 percent) and dairy (28.3 percent) with sulphate reducing bacteria, *E. coli*, coliforms, *S. aureus* and Salmonella were considerably beyond acceptable limits (Kharroubi *et al.*, 2020).

2.3.3 Impact of shocks and stresses on consumer behaviour influenced by individual filters

While healthy diets are crucial for nutritional well–being, the utilization dimension of food security brings out the importance of non–food inputs such as clean water, sanitation and health care for good biological utilization of food consumed. As highlighted in previous sections, in the Arab Region rapidly changing diets, limited freshwater and food safety issues contribute to the utilization challenge, making consumption a vulnerable component of Arab food systems.

Although access to sanitation facilities is high in most countries of the region, there are conflict complications (FAO, 2017). Conflict countries have high prevalence rates of stunting and wasting in children under five, which often are the results of high levels of infections due to unsafe and insufficient water supply and inadequate sanitation.

Food security strategies in the region prioritize food production and availability, while excluding nutrition (Hwalla *et al.*, 2016). While there has been significant progress in the Arab Region in ADESA (average daily energy supply adequacy, FAO's food and nutrition security indicator), it is evident from the data in Part 1 that this is not translating into improved nutrition and health outcomes for the population.

BOX 6.
DIETS AND HEALTH RISKS IN GCC COUNTRIES

One-quarter of the population in the Arab Region is obese with higher rates among women than men (ESCWA, 2017), the GCC countries among the most affected. The transition towards unhealthy diets is associated with changing economies, especially in the GCC. The major economic activities in the Arabian Gulf before the oil boom included agriculture, grazing, and fishing. Diets changed following the economic transformation towards energy-dense, nutrient-poor foods, resulting in higher obesity. Changed habits, such as eating more often in restaurants, using more salt and employing a family cook have also played a role.

Diets linked with obesity containing excess calories, sugar, salt, fat, and protein, are also associated with NCDs. The Arabian Gulf countries have the highest prevalence of NCDs in the world (Zaghloul *et al.*, 2013). In Kuwait, significant percentages of the population have diabetes (15 percent), metabolic syndrome (24 percent), coronary heart disease and hypertension (26 percent) and dyslipidaemia (33 percent), all diseases related to diet (Zaghloul *et al.*, 2013).

Consumer behaviour is affected by pressures exerted in the food environment as well as individual factors. "Supermarketization" in the Arab Region, where the share of modern retail space increased from 12.9 percent in 2003 to 32.7 percent in 2017 (Bahn and Abebe, 2019) will likely impact on consumption as well as access to food. Modern retail spaces often carry a lot of food advertising, especially of processed and fast foods that are high in sugar, salt, and saturated or trans fats. Overconsumption is linked to obesity, a major food security and nutrition issue

in the region. Food advertising also influences consumer choices and alongside affordability and other factors, can determine diet choices. Nutrition education will contribute to healthy dietary behaviours such as school interventions, nutrition education for mothers at healthcare centres and public information through, for example, food–based dietary guidelines and social media. There are few studies of the impact of nutrition education on consumer behaviour change or their efficacy in influencing consumer food choices. However, evidence from the region suggests school programmes can improve students' food consumption, especially if they run for longer periods and are integrated into school activities and curricula.

2.4 ANALYSIS OF POLICY RESPONSES TO FOOD SYSTEMS' RESILIENCE IN THE ARAB REGION

Some policies in the region have broadened food system vulnerabilities even if their intent was improved food security. Intensive wheat farming in Saudi Arabia, at great cost to freshwater aquifers, is an example of such policies (FAO, 2008). Increasing strategic reserves and enhancing local food production to make food systems more resilient to shocks has had varying levels of success. The following case studies propose policies that bolster resilience in regional food systems.

2.4.1 Which policies address food system resilience in the Arab Region?

Policy responses that enhance resilience in Arab Region food systems

Section 2.2.1 assessed the impacts of three shocks affecting the Arab Region in addition to conflicts. These are climate–related, economic

shocks and the Covid–19 pandemic containment measures. This section illustrates policy responses of selected countries to economic shocks and Covid–19 and how a number of Arab countries used the experience of the 2008 global food crisis to strengthen food system resilience.

The 2008 crisis was a wake–up call for all Arab countries. The causes of the crisis were a combination of climate events (droughts and poor harvests), the global financial crisis, commodity speculation and diversion of grain crops, mostly soy and maize, from agriculture into biofuel production (Mittal, 2009). Some countries restricted their exports, leading to global shortages and international price increases. All Arab countries rely on food imports but the Gulf countries are totally dependent on trade. The crisis damaged political stability, as food price increases catalyzed the Arab Spring, mobilizing people around a basic need: food.

As the crisis unfolded, most countries in the Gulf began a multilevel process to improve food security with extensive funding of research, development and food security strategies. For the past decade, all Arab countries, with the support of international organizations and international consulting firms, have focused on improving food security, to make systems resilient in terms of food availability. Only recently are healthy diets and sustainability part of the food security discourse, yet to be translated into effective and implementable nutrition policies.

The United Arab Emirates created a ministry for food security while other countries set up new departments or reformed existing ones to address food availability. The elements of a blended strategy were: 1) sustainably enhance food production within physical and environmental limits; 2) improve trade through bilateral agreements and diversified trade partners; and 3) overseas agricultural investments including land. This last approach was too controversial and given a lower priority.

The Covid–19 pandemic emerged in 2019 with a global food system that was increasingly unstable due to unsustainable practices. Luckily, food

production that year exceeded demand due to bumper harvests. In spite of export bans by food producing nations, trade continued and prices of food staples remained relatively stable. Although too early to judge as the data are still being collected, it appears disruption to food security was limited in countries of the Arab Region that prepared themselves after the 2008 crisis. Although their food security was affected, it did not fail.

What was the impact of the pandemic on the Arab Region and how did countries respond?

The Covid–19 pandemic caused significant disturbances to food security and nutrition (HLPE 2020; Savary *et al.*, 2020) including the Arab Region.[22] The disruption to global value chains, especially wheat, rice, soybean and meat due to labour and transport issues, and a trade ban by some exporting countries, compounded lockdowns in exporting and importing nations. Virus containment measures and the economic recession affected every aspect of food and nutrition security. Lockdown put pressure on food systems, disrupting local, regional and global food trade, preventing food workers from doing their job and reducing people's ability to access food. In several countries of the Arab Region, particularly GCC countries, the food system could absorb the shock, at least in terms of availability and access, due to resilience preparedness, rapid response and strategic reserves built into the system after the 2008 food crisis. All actors in the food system were involved: governmental, humanitarian, private, and non–governmental including producer organizations and cooperatives. Responses focused on availability and access, while utilization was not a priority. Action was taken to strengthen the food supply chain principally (imports, local production, food waste) and the food environment (affordability, price control, food sharing). Little attention was paid to the healthiness of diets.

Responses targeting resilience capacities of the food supply chain

Food supply resilience aims to increase commodity inflow, decrease trade outflow and enhance production, through digital technologies and supporting local organizations and farmer groups. Below are examples of responses implemented in the Arab region to strengthen resilience of food supply chains.

A. Implement an aggressive import strategy, ease customs procedures and increase quantities in storage.

Algeria purchased eight million tonnes of wheat as early as April 2020 (Reuters, 2020).

Qatar increased storage of essential foods such as wheat, edible oils, rice, frozen red meat, long–life milk, powdered milk and sugar (Baladna, 2020; Food–navigator, 2020) exempting food imports from custom duties (IMF, 2020e).

B. Diversify trade partners

Egypt diversified suppliers by, for example, accrediting Brazilian food companies (ANBA, 2020).

Jordan facilitated burghul and pulses imports from Turkey as an alternative market (WFP & FAO, 2020).

Qatar signed an agreement with 14 new companies to diversify suppliers.

C. Impose export restrictions to improve local production and logistics

Algeria banned food exports (IMF, 2020e).

Egypt temporarily halted exports of legumes (IMF, 2020e).

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[22] The following section draws partly on an FAO report: Policy responses to the COVID–19 crisis in the Near East and North Africa: keeping food and agriculture systems alive (FAO, 2020a), with details of policy responses and specific information on actions taken.

D. Improve local production and logistics

Algeria invested in agriculture to boost cereal production, in particular maize, as well as meeting requirements for sugar, oil and other cereals (Le portail du Premier Ministère, 2020).

Egypt increased irrigation investments by 2 percent and expanded cultivation of wheat, oil crops, sugar crops, improved sugar cane productivity and set up stores for basic foods (IFP Info, 2020).

Kuwait invested in high–tech greenhouses to produce fruits and vegetables (Oxford Business Group, 2020) with USD 100 million invested by Wafra International Investment Company.

Saudi Arabia's action plan supports food security and production (Arab News, 2020), allocating USD 665 million to support farmers and reduce import reliance (Abu–Nasr and De Sousa, 2020).

United Arab Emirates imported 4 500 dairy cows to boost milk production (Habboush, 2020).

E. Support producers, cooperatives, producer organizations and smallholder farmers

Algeria encouraged smallholder farmers to plant available lands with fruit trees and grain legumes to enhance diversity and consumption security (Grim, 2020).

Morocco supported small and medium producers to group their produce for export and helped farmers find alternative outlets to closed markets (Agrimaroc, 2020a).

Lebanon set up small marketing platforms to link producers to consumers as the country suffered from both the pandemic and an economic and financial collapse (Ricour–Brasseur, 2020).

F. Adopt smart technologies to facilitate trade and enhance local productivity

Jordan set up an online licence system to promote exports of surplus local food (WFP and FAO, 2020).

Oman set up a smart agriculture project to achieve self–sufficiency in vegetables while preserving the environment and natural resources, mechanizing irrigation, pest management, soil monitoring and crop handling (Zawya, 2020).

Dubai established a USD 40 million project to build a vertical farm for crops like quinoa and vegetables free of herbicides and pesticides (Al Arabiya, 2020).

Morocco set up a system to ensure a continuous supply of sugar.

G. Revise the approach to overseas agricultural investments

Saudi Arabia boosted farming abroad in ten countries in Africa, the Black Sea and Latin America, offering low interest loans totalling USD 533 33 million to companies that sent at least half their harvest to Saudi Arabia (Arab News, 2020; Abu–Nasr and De Sousa, 2020).

Responses directed at enhancing resilience at the food environment level

Resilience strategies at food environment level involved all food system actors, providing social support and safety nets for fragile communities; implementing policies to stabilize prices; undertaking actions to protect small businesses and workers whose income was affected by the pandemic with cash payments for small enterprises, informal sector workers and those who lost their jobs because of the pandemic. Below are examples of such responses, in particular to Covid–19.

➔ In the Arab Region NGOs (non–governmental organizations) and civil society distributed food aid to the vulnerable and families in need.

➔ In Egypt 70 companies contributed USD

3.2 million to deliver food to the most affected, with donations expected to reach USD 9.55 million (Middle East Monitor, 2020).

→ Palestine NGOs distributed 60 tonnes of vegetables and 5 tonnes of dates to poor families (UNOCHA, 2020).

→ Humanitarian organizations distributed e–vouchers, cash transfers or food in many countries, especially poor countries, those in conflict or with large numbers of displaced people and refugees.

→ Jordan provided USD 1.3 billion in assistance in March to reform the economy and deal with the pandemic (IMF, 2020f) although the WFP continues to provide humanitarian assistance including cash transfers to refugees (WFP & FAO, 2020).

→ The IMF Executive Board approved a 12–month Standby Arrangement (SBA) to Egypt of USD 5.2 billion to address financing needs arising from Covid–19 (IMF, 2020g).

→ Morocco supported 85 percent of informal households with a monthly payment of USD 80–120 (FAO–GIEWS, 2020).

→ Egypt supported farmers via offset fixed prices for wheat and bran to prevent bread price increases and delayed debt repayments for six months for farmers with a two year delay in paying tax on agricultural land (IFPRI, 2020; IMF, 2020e).

→ Iraq allowed agriculture leaseholders postpone paying land rental (FAO, WFP, World Bank, 2020a) and exempted farmers from land taxes for several years (FAO WFP, World Bank, 2020b).

→ Qatar set maximum retail food prices with penalties for non–compliant retailers (Food Navigator, 2020).

→ Tunisia established an authority to track the supply schedule of basic commodities (OECD, 2020a).

→ Algeria mitigated the economic impact of the virus with USD 156 million for those who lost their jobs, and USD 90 million for poor households (IMF, 2020e).

→ Egypt disbursed USD 6.4 billion to support both the stock market and poor families with USD 2.9 million for informal workers who lost their jobs (OECD, 2020b).

→ Kuwait's stimulus package provided a minimum salary to cover basic living costs for those affected, ensuring food stability in markets, unemployment benefits and low interest loans to small and medium enterprises (IMF, 2020e; KPMG, 2020).

→ Morocco delivered financial aid to remote rural areas to ease the adverse economic impacts of the virus (AgriMaroc, 2020b).

The Arab Region managed to limit much of the potential damage to food security from Covid–19 but did not address a number of salient issues.

1. Given the chronic absence of food security and nutrition data in the region since the pandemic struck, even among more affluent countries, it is difficult to assess system resilience or the impact of strategies adopted.

2. The Arab countries that took rapid response actions are essentially the oil–rich nations, other countries have to rely on donor generosity. As the pandemic continues and information that the 2020 harvest was not as bountiful as 2019, there is concern about the sustainability of aid to the growing list of countries in need. Lebanon has joined the ranks of the needy countries following an economic crisis, pandemic measures, social unrest, the impact of sanctions by the United States of America on Syria with Lebanon's financial meltdown and hyperinflation.

3. While food security and nutrition approaches have greatly evolved since 2008, the focus is still on food availability and access. Healthy diets and nutrition still require attention, despite the data in Part 1 confirming a large part of the food security and nutrition failures relate to unhealthy diets and excessive consumption. It is likely the human cost of overweight, obesity and unhealthy diets is greater

than undernutrition. The wider problem is how to make healthy diets affordable for all, during a shock, a disturbance or in regular times and is key to improving outputs of Arab food systems.

2.4.2 Recommended policy approaches and actions

This section suggests policy directions and actions to shock–proof the region's food systems and heighten their resilience to support efforts to achieve sustainable healthy food systems and make progress towards the SDGs.

➜ Initiate a radical transformation towards a sustainable, equitable and inclusive food system delivering affordable healthy diets and nutritious foods to all.

➜ Build on intersystem linkages to develop relevant food policies.

➜ Focus on malnutrition with a better understanding of the complex causes.

➜ Adopt a context approach to food security and nutrition at individual, household, class and regional levels.

The following policy actions are recommended.

1. Systematic assessment of food system sustainability and resilience by:

   A. Formalizing the food system framework as an interactive, holistic lens to examine components, drivers and outputs, environmental, economic and social alongside food security and nutrition.

   B. Engage in monitoring, fragility testing and resilience assessment using the tools suggested and the food systems dashboard as an integral part of planning.

   C. Create an evidence–based decision–making system by collecting, analyzing and sharing data with international and national clearing houses.

   D. Develop sets of resilience and sustainability

indicators drawing on the SDG and WHA indicators as well as lists in this report.

2. Bolster the food system by strengthening its components.

   A. Food supply chains

   Production systems

   ➜ Transition towards sustainable and nutrition sensitive agricultural production. Production systems must deliver safe, healthy, sustainably produced, affordable and accessible nutrient–rich food for a healthy diet. Governments could shift research into sustainably produced nutrient–rich crops.

   ➜ Linking farm to school. This will contribute to a change in eating habits, improve children's nutrition knowledge, affecting the entire household and provide stable markets for local producers.

   ➜ Protect vulnerable workers throughout the food chain, especially women who may be disproportionately affected by crises or shocks.

   ➜ Improve access to services and finance, provide forecasting data and crop insurance, especially for women and the rural poor. This will enhance the resilience of local food chains, particularly for smallholder farmers.

   ➜ Invest in long–term grain storage and market infrastructure.

   ➜ Foster short, diversified supply chains and address food deserts.

   ➜ Build immediate response systems to ensure uninterrupted inputs in times of crisis.

   ➜ Make farmers part of the resilience plan with training for crisis preparedness.

➔ Strengthen smallholders' organizations and their capacity to provide services and facilitate market access.

Retail and markets

➔ Support local, diversified, small and medium distribution chains, essential components of resilient systems. Policies should aim to level the playing fields with the larger outlets and eliminate their often unfair privileges, to limit the negative outcomes of supermarketization.

➔ Improve supply chain efficiency, support renewable energy transport and cold chain infrastructure to reduce food losses, increase the availability of such foods and make them more affordable.

Imports and trade

➔ Recognize the importance of diverse trade partnerships and imports.

➔ Invest in an early market warning system for nutrition–sensitive trade. The Rome Declaration of ICN2 (Second International Conference on Nutrition) acknowledged trade is key to achieve food security and nutrition and is conducive to food security and nutrition for all. Trade policies can support nutrition actions or undermine them so coherence between them is essential.

B. Food environment

Physical accessibility

➔ Ensure healthy diets are available to all through markets and trade.

➔ Support smallholders to supply nutritious foods, invest in producer organisations and innovative technologies and encourage retailers to stock more healthy, nutritious foods.

➔ Address food deserts and food swamps23 through infrastructural and spatial policies.

➔ Ensure that settings such as hospitals, schools and workplaces adopt nutrition standards in the food they procure and offer.

➔ Integrate nutritious, healthy food assistance into resilience and social protection systems.

Affordability

➔ Through pricing policies make healthy diets the default option for low–income, vulnerable segments of the population.

➔ Initiate robust social protection programmes in the form of cash or food transfers to improve nutritional outcomes for vulnerable groups, in particular children under 5 and women of reproductive age.

Promotion and advertising

➔ Adopt regulatory measures to restrict marketing of unsuitable food and beverages to children.

➔ Implement the International Code of Marketing of Breast Milk Substitutes, WHA resolutions and the WHO Recommendations on Marketing of Food and Non–Alcoholic Beverages to Children.

➔ Replace non–nutritious foods in schools and workplaces with nutritious alternatives, impose taxes to discourage consumption of foods high in fat, sugar and salt and use price incentives to encourage consumers make better choices.

➔ Impose strict nutrition labelling rules to encourage healthy food choices with nutrition literacy programmes and require manufacturers to use accurate, informative labelling.

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23 Food deserts are areas where access to food is restricted or non–existent due to few food entry points within a practical travelling distance. Food swamps are areas with an overabundance of less nutritious foods but little access to nutritious foods.

Food quality and safety

➔ Strengthen food traceability at all production stages and improve storage especially in times of crisis.

➔ Improve market standards, including investing in infrastructure to meet cleaning and phytosanitary standards.

C. Consumer behaviour, preferences and choices

➔ Engage in multistakeholder programmes to catalyze social and behavioural change through effective communication, with special focus on nutrition education.

➔ Develop food–based dietary guidelines to provide information and guide consumers, producers and policymakers, harmonized with food system sustainability outcomes.

➔ Take into account social norms, values and traditions in social and behavioural change, based on a variety of local diets.

2.5 OVERALL CONCLUSIONS: LINKING FOOD SECURITY AND NUTRITION DATA WITH FOOD SYSTEMS AND RESILIENCE CAPACITIES

Although data remain a significant limitation to region–wide analysis, it appears after an initial improvement, only a small number of Arab countries are on track to meet the SDG 2030 targets and none are likely to reach 2025 WHA targets. The reasons are numerous, some intrinsic to the region (limited natural resources, conflict and occupations) and some extrinsic (global economic crisis, Covid–19). These findings confirm that the Arab food system is failing to provide sustainable food security and nutrition to a region exposed to frequent shocks and stresses. For instance, the PoU (prevalence of undernourishment, an SDG 2 indicator) has continued to rise since 2012–16 (Figure 1). In 2012–16 there was a slump in the price of oil and therefore national incomes accompanied by a surge in the numbers affected by conflict. The food system is vulnerable to shocks and stresses and lacks resilience, "the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks".

The Arab Region has been unable to reverse the downward trend in food security or the rise of overweight/obesity, showing the need to adapt previous analytical approaches to food security and nutrition, anchoring the analysis in food systems to assess resilience.

Part 2 analyzed the four components of food systems: the food supply chain, food environment, individual filters and consumer behaviour and diets. A number of drivers can facilitate or hinder the system's functioning ranging from biophysical and environmental to political and demographic. Of the four outcomes of food system this report underscores the importance of environmental, social and economic outcomes but is limited to food security and nutrition outcomes.

It examines resilience and its relationship to sustainability with a framework to evaluate the resilience of food systems using resilience capacities and principles, suggesting options with a sample list of indicators.

An intermediate conclusion is that four major shocks and stresses, conflict, wars and occupation, climate shocks, macroeconomic shocks and health, exemplified in Covid–19, have caused the failure of the food system

to reduce hunger and malnutrition in the region. Proposing a framework the report identifies stresses and drivers and their effect as impact–multipliers. The report then explores vulnerabilities of the four components using examples and case studies.

The report examines the resilience of the Arab Region food system in responding to the 2008 food crisis and how it confronted the Covid–19 pandemic to avoid systemic failure. The responses were numerous and diverse, but limited to the food supply chain and environment components of the food system, neglecting individual filters, consumer choice and diets. These determine poor health outcomes and are associated with NCDs. Thus, the Arab Region has succeeded in making part of the system resilient but failed to incorporate resilience in all components of food systems. The neglect of healthy, affordable diets, at great human and environmental cost, is also explored indicating a healthy diet is still unaffordable for the majority in the Arab Region.
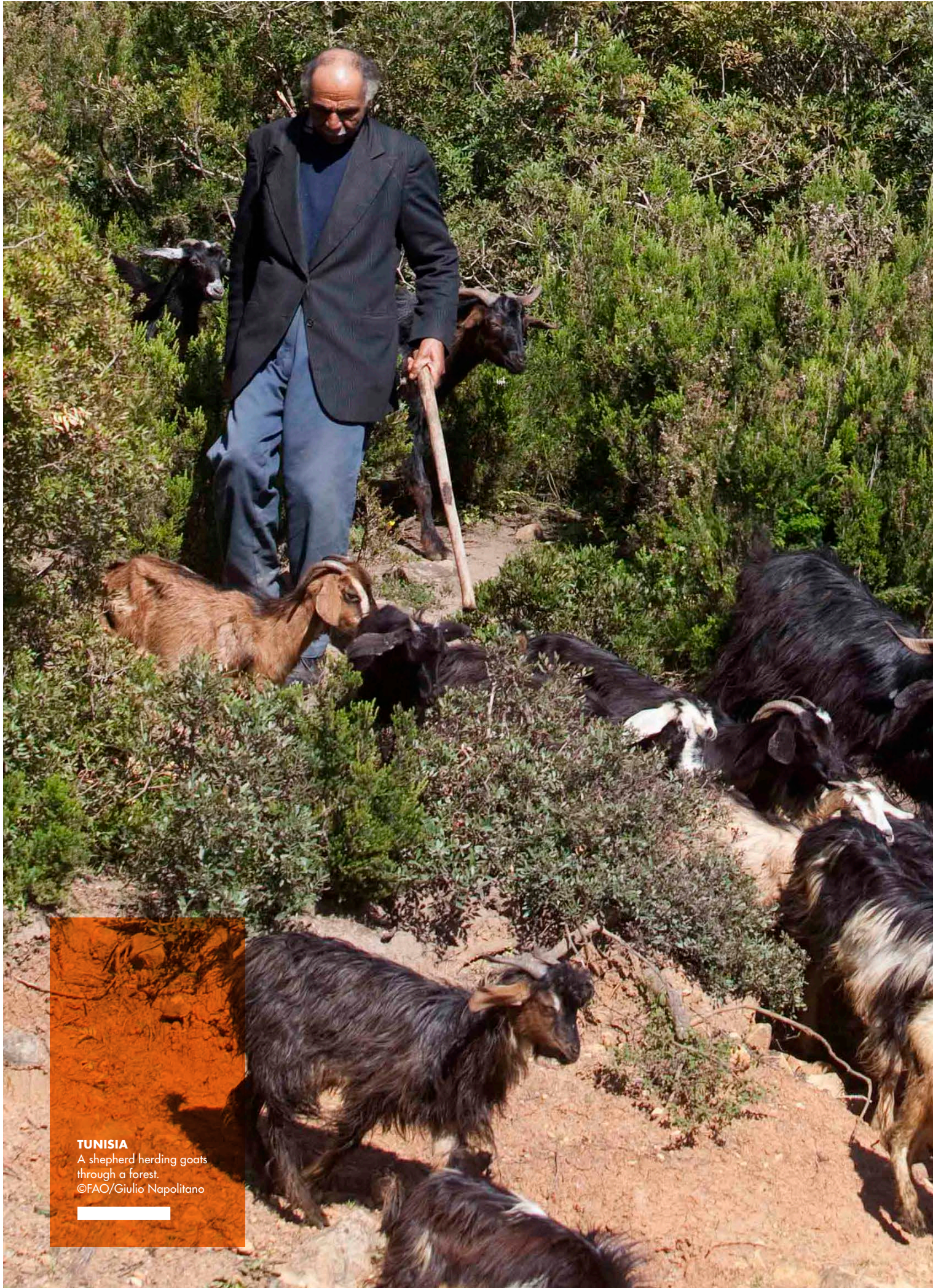
TUNISIA
A shepherd herding goats
through a forest.
©FAO/Giulio Napolitano
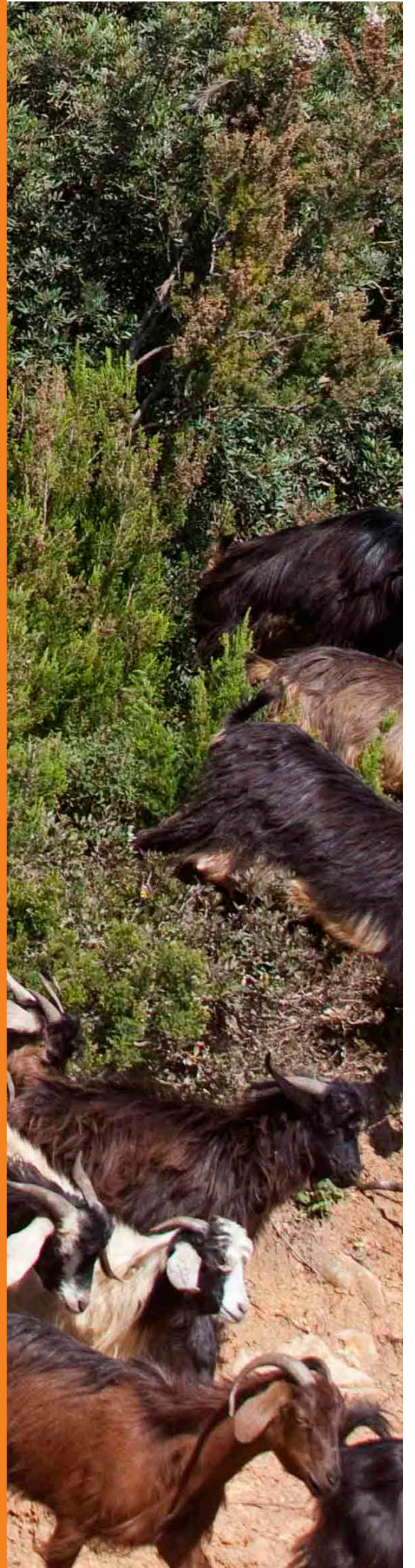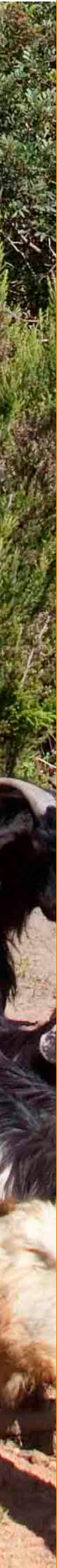
ANNEXES

ANNEXES

TABLE A.1.
TENTATIVE SUSTAINABILITY INDICATORS REFLECTING FOOD SYSTEM OUTCOMES

SUSTAINABILITY DIMENSION	SUSTAINABILITY INDICATOR	WEBSITES USED FOR DATA
ENVIRONMENT	Greenhouse gas emissions from agriculture	FAO Stat: http://www.fao.org/faostat/en/#data/GT CH4,CO2, NO2 (Gigagrams) Example, Algeria: emissions (CO2eq) 8 823 in 2007 – 10 795 in 2012
	Agricultural water withdrawal	AQUA Stat: http://www.fao.org/nr/water/aquastat/data/query/results.html Example,Saudi Arabia: 17.51 (10^9/year) in 2012 – 19.2 (10^9/year) in 2017
	Pesticide use in agriculture	FAO Stat: http://www.fao.org/faostat/en/#data/EP Example, Iraq: 0.15 kg/ha in 1998 – 0.04 kg/ha in 2018
	Agriculture area actually irrigated	FAO Stat: http://www.fao.org/faostat/en/#data/EL
	Agricultural land as % of arable land	FAO Stat: http://www.fao.org/faostat/en/#data/EL Lebanon: 30% in 1990 – 20% in 2018
ECONOMIC	Agriculture, forestry, and fishing, value added per worker (constant 2010, USD)	World Bank: https://data.worldbank.org/indicator/NV.AGR.EMPL.KD Example, Egypt 4,381 in 2002 versus 3,734 in 2004
	Trade indices of agricultural products	FAO Stat: http://www.fao.org/faostat/en/#data/TI SSR Self–sufficiency ratio
	Cereal import dependency ratio	FAO Stat: http://www.fao.org/faostat/en/#data/FS
	Gross domestic product per capita, PPP, dissemination (constant 2011 international, USD)	FAO Stat: http://www.fao.org/faostat/en/#data/FS
SOCIAL	Labour force participation in agriculture % female	International Labour Organization: https://data.worldbank.org/indicator/SL.AGR.EMPL.FE.ZS?locations=EG–LB–SY

TABLE A.1
(CONTINUED)

SUSTAINABILITY DIMENSION	SUSTAINABILITY INDICATOR	WEBSITES USED FOR DATA
FOOD AND NUTRITION SECURITY	Prevalence of obesity (% of the population, over 18 y of age	WHO: https://www.who.int/news–room/fact–sheets/detail/obesity–and–overweight Current Overview, Part 1
	Prevalence of severe food insecurity in the total population, %, 3 year average	FAO Stat: http://www.fao.org/faostat/en/#data/FS
	Prevalence of undernourishment, %, 3 year average	FAO Stat: http://www.fao.org/faostat/en/#data/FS
	Access to improved water resource, % of total population	FAO Stat: Population having at least basic drinking water services, % FAO Stat: Population using safely managed sanitation services, % http://www.fao.org/faostat/en/#data/FS
	Price volatility index	SDG 2.c.1 Food price volatility: http://www.fao.org/sustainable–development–goals/indicators/2c1/en/
	Per capita food supply variability, kcal/capita/day	FAO Stat: New Food Balances http://www.fao.org/faostat/en/#data/FBS
	Burden of foodborne illness, number of cases	WHO https://www.who.int/activities/estimating–the–burden–of–foodborne–diseases
	Food loss as % of total food produced	FAO Stat: Food losses: http://www.fao.org/faostat/en/#data/FBS SDG 12.3.1.a – Food Loss Index or 12.3.1.b – Food Waste Index
	Serum retinol deficiency Prevalence of anaemia among women of reproductive age, 15–49 Exclusive breastfeeding among infants for the first 6 months, % Childhood stunting 0–5, % Childhood wasting 0–5, % Childhood overweight 0–5, %	SDG [2.2.3] Prevalence of anaemia among pregnant women FAO Stat: http://www.fao.org/faostat/en/#data/FS Current Overview, Part 1 Current Overview, Part 1 Current Overview, Part 1 Current Overview, Part 1 Current Overview, Part 1
	Diet diversification	SDG 2.5.1 is the number of plant and animal genetic resources for food and agriculture secured in either medium– or long–term conservation facilities [2.5.1.a Conservation of plant genetic resources for food and agriculture http://www.fao.org/sustainable–development–goals/indicators/251a/en/ 2.5.1.b Conservation of animal genetic resources for food and agriculture http://www.fao.org/sustainable–development–goals/indicators/251b/en/

Source: Adapted from Béné *et al.,* (2020), SDG indicators, tracking tools of food security in the Arab Region (ESCWA, 2019) and the author.

TABLE A.2.
COST OF A HEALTHY DIET IN THE ARAB REGION, 2017

COUNTRY	COST OF AN ENERGY SUFFICIENT DIET PER PERSON PER DAY (USD)	COST OF A NUTRIENT ADEQUATE DIET PER PERSON PER DAY (USD)	COST OF A HEALTHY DIET (MEDIAN) PER PERSON PER DAY (USD)
TOTAL ARAB REGION	0.77	2.27	4.02
Algeria	0.77	2.13	4.14
Bahrain	0.79	2.53	4.31
Comoros	1.10	3.46	5.44
Djibouti	0.62	2.17	3.72
Egypt	0.69	2.74	4.99
Iraq	1.06	2.08	4.00
Jordan	0.64	1.66	4.19
Kuwait	0.34	1.66	3.96
Lebanon	n.d	n.d	n.d.
Libya	n.d	n.d	n.d.
Mauritania	0.88	2.50	4.42
Morocco	0.61	1.98	2.85
Oman	0.52	1.66	3.13
Qatar	0.67	1.15	3.11
Saudi Arabia	0.88	1.85	4.19
Somalia	n.d	n.d	n.d.
Sudan	1.08	5.96	4.93
Syria	n.d	n.d	n.d.
Tunisia	0.60	1.68	3.68
United Arab Emirates	0.75	1.81	3.46
West Bank and Gaza	1.12	1.59	3.81
Yemen	n.d	n.d	n.d.

Note: n.d.= No data. Analysis of the cost and affordability of diets did not include the following countries: Lebanon, Libya, Somalia, Syria and Yemen.

MOROCCO
A farmer's wife spreading butter on freshly made bread typical of the region.
©FAO/Giampiero Diana

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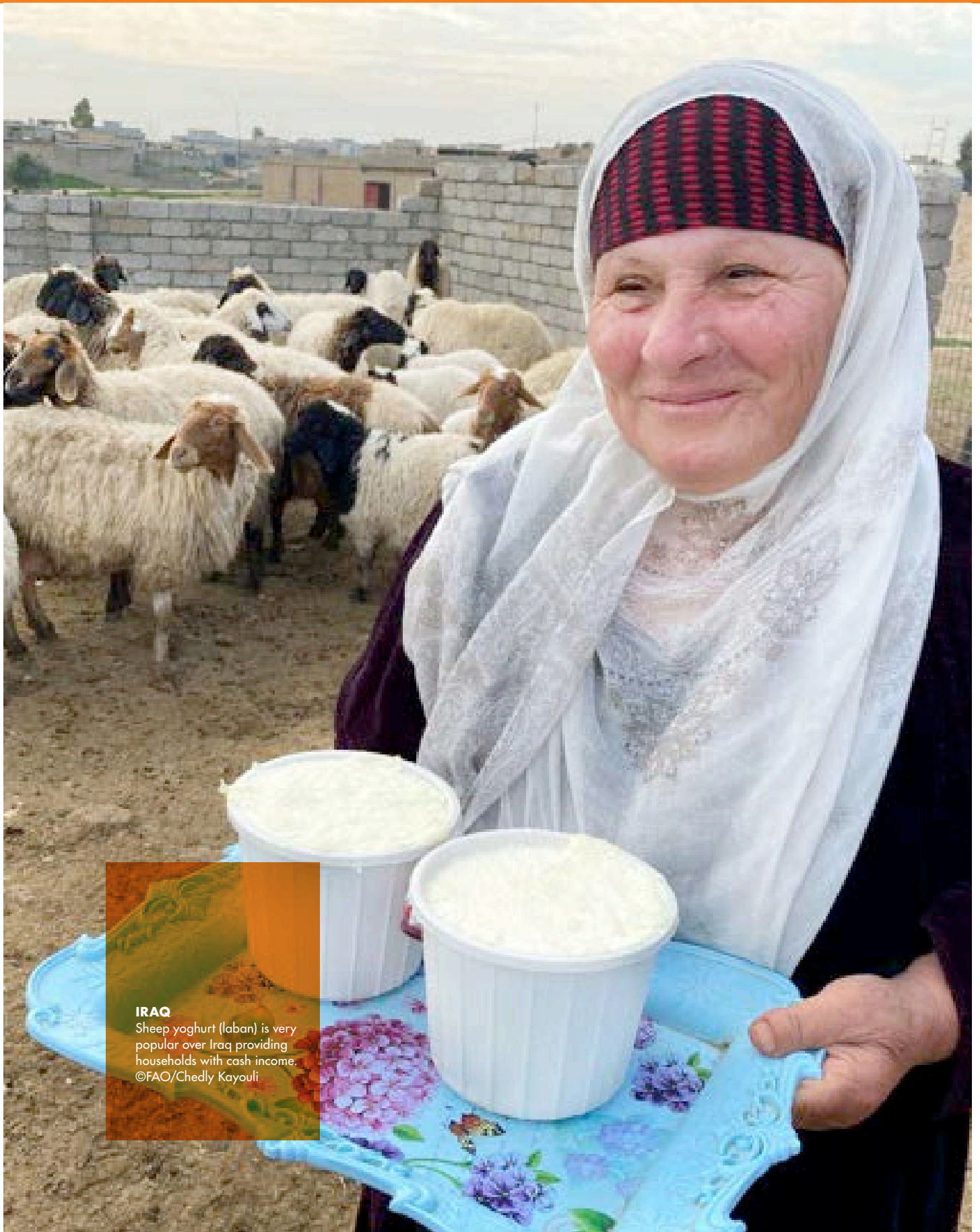
IRAQ
Sheep yoghurt (laban) is very popular over Iraq providing households with cash income.
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2020

NEAR EAST AND NORTH AFRICA
REGIONAL OVERVIEW OF FOOD SECURITY AND NUTRITION

The past few decades have seen dramatic improvements in the region in access to food, reduction in stunting rates, in premature death and disability caused by communicable, maternal, neonatal, and nutritional diseases. However, the gains in the fight against hunger and malnutrition have reversed in the wake of conflicts and violence that have spread in many parts of the region in the last decade.

Today, nearly 55 million people in the Arab States, 13.2 percent of the population, are hungry and the situation is particularly worrying in countries affected by conflicts and violence: Iraq, Libya, Somalia, Syria, the Sudan, and Yemen. Displacements and forced migration are widespread in the region, especially among the growing youth population segment.

Many countries carry a double burden of malnutrition, including overweight and obesity and undernutrition. A high or very high prevalence of stunting in children under the age of five persists in nearly half of the Arab States, while anaemia is a severe public health issue in certain countries. The trends of overweight and obesity continue to worsen for children and adults.

Beyond these numbers, the report explores food systems in the Arab States and the policies that support them. It also explores how the latter have contributed to poor nutritional outcomes by failing to make safe and diversified healthy diets available to all. While there has been significant progress in policies designed to reduce caloric deficiencies in the population, the policy reaction to address existing malnutrition problems, particularly in relation to overweight and obesity, has not been adequate considering the gravity of the problem.

THE STATE OF
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