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## COVID-19 AND FOOD SECURITY CHALLENGES IN THE MENA REGION

DINA MANDOUR

SUSTAINABLE DEVELOPMENT GOALS  
AND EXTERNAL SHOCKS IN THE MENA REGION:

FROM RESILIENCE TO CHANGE IN THE WAKE OF COVID-19

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# **COVID-19 and Food Security Challenges in the MENA Region**

**Paper submitted to ERF 27<sup>th</sup> Annual Conference, 2021**

Dina Atef Mandour<sup>1</sup>

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<sup>1</sup> Assistant Professor, Faculty of Economic and Political Science, Cairo University.  
Email: [dinamandour@feps.edu.eg](mailto:dinamandour@feps.edu.eg); [mandourdina@gmail.com](mailto:mandourdina@gmail.com)

***List of Abbreviations:***

CGE: Computable General Equilibrium

EIU: Economic Intelligence Unit

EU: European Union

FAO: Food and Agriculture Organization

FI: Food insecurity

FS: Food security

GCC: Gulf Cooperation Council

GDP: Gross Domestic Product

GRFC: Global Report on Food Crises

GFSI: Global Food security Index

GHI: Global Hunger Index

IFPRI: International Food Policy Research Institute

IMF: International Monetary Fund

LDCs: Least Developed Countries

MENA: Middle East North Africa

PAFTA: Pan Arab Free Trade Area

PoU: Prevalence of Undernourishment

PoMSFI: Prevalence of moderate or severe food insecurity

SAM: Social Accounting Matrix

SDGs: Sustainable Development Goals

SMEs: Small and Medium Enterprises

UN: United Nations

UAE: United Arab Emirates

USA: United States of America

WFS: World Food Summit

WHO: World Health Organization

WFP: World Food Program

## ***Introduction***

COVID-19 escalated from a public health emergency status to be declared by the WHO on the 11<sup>th</sup> of March 2020 as a global pandemic. The pandemic has been coined as “an extraordinary situation” where it represents a crisis of a unique nature that has affected all countries across the globe regardless of their economic status (ITC, 2021). Analogously within each country most of the segments and actors in the economy were negatively affected, though with different intensities. The COVID-19 crisis has substantially impacted the whole world, specially that it is a multidimensional crisis, where at the outset it is a health crisis, but at its core it is an economic as well as food security (FS) crises, hence making the world featuring a triple shock (Erokhin and Gao, 2020; Mouldji et. al, 2020). The extent of the impact of COVID-19 on FS is still not fully clear but as articulated by UN (2020), it could represent “an impending global food emergency of unknown, but likely very large proportions”. FAO has declared that FS of around 820 million people will be hard hit by the crisis, with 62% and 31% of which are concentrated in Asia and Africa respectively (Oraikat, 2020). The most substantial increase in the number of people suffering acute hunger in 2020 is likely to be concentrated in least developed countries (LDCs) of Sub-Saharan Africa, and developing economies of Middle East North Africa (MENA) and Latin America (Erokhin and Gao, 2020). Some forecasts suggest the addition of 83 to 132 million people to the ranks of undernourished in 2020 due to COVID-19 (FAO et al., 2020). Moreover, with the shrinkage of global trade that can reach a decline of 32%, food supply chains would be highly disrupted (Petetin, 2020).

The pandemic has posed considerable various challenges and risks in an array of areas and dimensions. Among such challenges is the momentum of Sustainable Development Goals (SDGs) which is likely to stagnate and many of the goals on top of the development agenda would be forced to recede. With lockdowns or confinements and alarming rates of loss of jobs, the second SDG concerned with achieving FS and improved nutrition, and promoting sustainable agriculture could be highly jeopardized. Furthermore, COVID-19 is highly expected to cancel out most of the previous and ongoing efforts and initiatives undertaken to improve FS status in many countries (Kinsey et. al, 2020). In addition, social distancing and constrained confinements have deprived many households of previous secure food supplies through restricting civil society initiatives. Combined with sharp resource shift, deviation of attention to the health sector, and significant drop in income or even total depletion in some cases, it is highly expected to have inflated food insecurity (FI) rates in most, if not all, of the MENA countries. The initial status of many countries in the region defines to a great extent the degree of vulnerability to such crisis where many initially suffer from political and/or economic instability that could hinder them from an optimal response to the crisis (Mandour, 2017). The macroeconomic performance and FS management signal another source of their fragility in facing COVID-19 crisis, and highlight the importance of establishing the right response of their governments in containing the FS dimensions of the crisis. Yet, as much as COVID-19 could potentially result in alarming risks and threats to FS rates, the picture is not totally gloomy, as so far global food availability has been adequate and there has been no worrisome price hikes. Still the pandemic is unfolding daily and uncertainties haunt the whole picture of its consequential effects.

This paper aims at assessing the link between COVID-19 and FS status with special focus on MENA<sup>2</sup> countries in a trial to classify them according to the degree of risk they could be susceptible to. The study aims also at outlining the main transmission channels through which the crisis could affect FS in general and in the MENA region in particular. Analyzing the various dimensions of FS including affordability, availability and utilization is another goal of the study to highlight the challenges and strengths that the region could possibly encounter within each component. Within this context, the paper would highlight the specific nature of MENA countries regarding the impact of the crisis on FS status and the factors behind variations of such impact. Finally, the study intends to quantitatively assess the impact of the pandemic on FS across countries with special emphasis on the relative situation of the MENA region.

The paper is structured as follows. Following the introduction, *Section One* represents the conceptual framework of the study elaborating the transmission mechanisms through which the pandemic can affect FS and provides a short literature review on the studies that analyzed the effect of the crisis on FS in developing countries. *Section Two* portrays the status of food security in the MENA region to comprehend the status of FS pre and amid the COVID-19 crisis. *Section Two* also outlines the various measures undertaken by MENA countries to mitigate the negative impacts of the pandemic. The quantitative analysis is undertaken in *Section Three* where a cross sectional regression is applied to empirically investigate the nature of the relationship between the pandemic and the status of FS with special emphasis on the effect on MENA countries. *Section Four* concludes and highlights the policy implications.

### **Section One: An Overall Overview of Food Security and the Special Nature of COVID-19 Crisis**

The definition of FS has been constantly amended and widened to capture most of the factors that can shape the dimensions of the problem. It went through different stages, from being regarded as a physical problem of supply (availability) to an economic problem of a shortage of purchasing power (affordability) to the necessity of food allowing for active and healthy life adding up the nutritional aspect (utilization). The definition of the World Food Summit (WFS) in November 1996 for FS has been the commonly accepted and adopted one as it encompassed the different angles of the problem: “Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life.” This generally accepted definition describes what are known as the dimensions or pillars of FS: accessibility, availability, and utilization (Napoli, 2011; Barret, 2010). Accordingly, FS is affected by a set of direct and indirect factors that define those three pillars. Among such factors are GDP growth level, and specifically of the agricultural sector, population growth rate, poverty level, food consumption patterns, effectiveness and efficiency of food subsidy systems, if any, macroeconomic conditions, water and land availability, environmental conditions, and political instability.

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<sup>2</sup> The paper follows the World Bank classification where the Middle East and North Africa (MENA) countries include: Jordan, Egypt, Syria, Qatar, Iran, Algeria, Bahrain, Djibouti, West Bank and Gaza, Iraq, Israel, Libya, Kuwait, Lebanon, Malta, Morocco, Oman, Saudi Arabia, Tunisia, United Arab Emirates, Yemen.

The IMF<sup>3</sup> projected a slowdown in the global economy in 2020 by around 4.4% as a result of the pandemic with an unambiguous economy-wide adverse effects world-wide. The effect on FS is largely defined by its initial status before the outbreak. After a decade of declining trend in the number of undernourished worldwide since 2005<sup>4</sup>, the figure started to take an upward shift since 2015 witnessing an escalation by 3 percentage points from 2014 to 2018 (Fan et. al, 2020). In 2019 around 821 million people representing around 10% of the world's population were suffering from hunger and another 690 million were undernourished (8.9%) adding up 60 million since 2014 (GHI, 2020). In the same year the number of people in acute FI reached its peak value since 2016 (Fan et. al, 2020). Hence, the status of FS was already experiencing a relapse before the onset of the pandemic in 2020. By the end of 2020 and as a result of the ongoing repercussions of the pandemic, food supply has been restricted to an additional 260 million people. Moreover, the impact could be exacerbated by the effect of locust outbreaks, armed conflicts and political unrest that together with the COVID shock could lead to a twofold figure for food insecure people in the globe (Ling Ma et. al, 2021).

As long as the pandemic and its aftermath are still unfolding it is extremely difficult to arrive at a clear assessment of its impact on FS. At the outset there seems to be a positive link between the countries' ability to handle the pandemic according to their structural, demographic, economic and institutional rigidities as expressed by the INFORM COVID-19 risk index<sup>5</sup> and FI as depicted in Figure 1. In fact, the majority of the studies found a significant adverse impact of COVID<sup>6</sup> on measures of FS with high degree of country/ macro level, sector/ commodity as well as household/ micro level contingency (Mouldji et. al, 2020). For example, Amare et. al, (2020) found that a 100% increase in the number of confirmed cases in Nigeria raise households' endurance of FI by 2-3 percentage points and shrinkage of economic activities by 1-3 percentage points. They further found a number of household specific results where milder negative impacts on FS for farming activities were detected. On the other hand, relatively harsher negative impacts on households relying on non-farm businesses, those with school-aged children and living in remote and conflicted-affected zones were indicated. Elshoryi et. al, (2020) concluded, through a cross sectional analysis, that the pandemic exerted a negative effect on food supply and demand, and resulted in weakening the purchasing power, and the capacity to produce and distribute food in Jordan. Such studies identified that poor segments of the societies (including casual workers and informal sector in general) are the most vulnerable groups subject to job losses. Also, on the demand side, the percentage of income spent on food is higher in poor segments implying a more drastic effect on FS if income is negatively affected for the poor. On the supply side, labor represents the major, if not the only, productive asset for the poor compared to the rich and hence the lock down effect is likely to be substantial for the poor when compared to the rich (Swinnen and McDermott, 2020). Further, a number of studies indicated that the economic slowdown will be accompanied by a decline in income, rise in unemployment, and poverty levels, all of which can affect the consumption habits of food products by shifting from the high income elastic products to low income elastic products (Schmidhuber et. al, 2020; Swinnen and McDermott, 2020; Workie et.

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<sup>3</sup> <https://www.cnbc.com/2020/10/13/imf-world-economic-outlook-2020-amid-coronavirus-crisis.html>

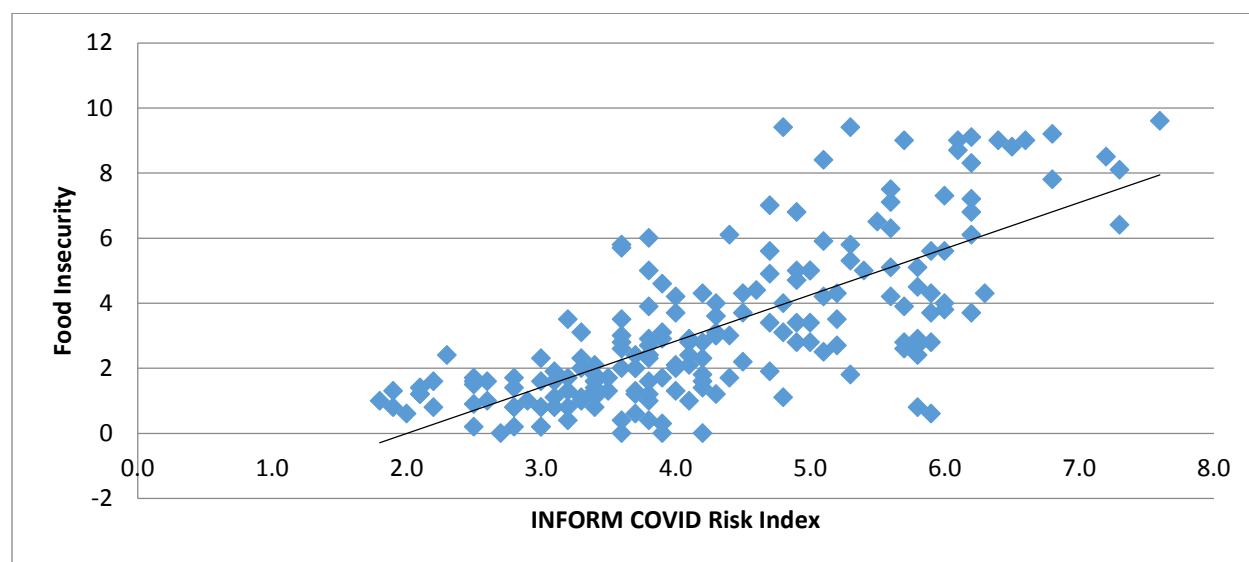
<sup>4</sup> <https://ourworldindata.org/grapher/global-population-defined-as-undernourished>

<sup>5</sup> More elaboration on the INFORM COVID Risk Index is given in *Section Three*.

<sup>6</sup> The majority of the studies took the number of confirmed cases as a measure for the intensity of the crisis.

al, 2020). Such impact is likely to affect the accessibility and utilization pillars of FS arising mainly from income effects.

**Figure 1: COVID-19 Readiness Risk Index (INFORM COVID Risk Index) and Food Insecurity Worldwide**



Source: Adapted from Poljanšek et al. (2020); European Commission (2020)<sup>7</sup>

Likewise, country specific outcomes regarding FS impacts of COVID were constantly noted. Low income countries with high food import dependency, high political instability or experiencing war or conflict and high agriculture contribution to GDP were perceived to be more prone to be strongly hit by the crisis (Udmale et al., 2020). Erokhin and Gao (2020) illustrated that the majority of the developing countries that experienced strong adverse impact due to the pandemic relied heavily on agricultural imports. Erokhin and Gao (2020) also found a positive significant relationship between the number of registered COVID-19 cases and FI across 45 developing countries with a weaker intensity or even a reverse direction of relationship within the low income economies among which are Turkey, Yemen, Iran, Jordan, and Libya in the MENA region. The authors justified such a relationship by arguing that the link between both variables does not depend on the country's income levels. This result supports the argument that higher-income countries are more likely to face food supply disruptions during the pandemic. One of the reasons for that is their high dependence on intermediate inputs in agricultural production. High-income countries depend more on intermediate inputs for their agricultural production processes and are hence more susceptible to a disruption in the input supplies, as potentially would be caused by the pandemic. This means that on average, low-income countries are less exposed to disruptions in intermediate input supplies, as production is less reliant on their utilization (Schmidhuber et. al, 2020). On the other spectrum, a number of studies reached the conclusion that the majority of the developed world is found to be relatively resilient to food supply shocks (Mouloudj et. al, 2020; Udmale et. al, 2020). In contrast to low-income countries,

<sup>7</sup> <https://drmkc.jrc.ec.europa.eu/inform-index/inform-covid-19>

upper-middle-income economies are deeply integrated into global capital and technology intensive supply chains of value-added food products which gives them an advantage by being able to adapt to the crisis and contain the shock.

The COVID-19 pandemic affects all FS pillars, yet again with an uneven country-specific impact (Niles et. al, 2020). Erokhin and Gao (2020) found that it affects the availability pillar of FS through food trade restrictions and currency depreciation in high income developing countries compared to low income ones where the effect is more evident on the accessibility (food inflation) pillar. The COVID-19 pandemic threatens accessibility to food through effects on associated food transport costs and logistics, including changes in food assistance distribution mechanisms, public transit access, and shortages of certain products.

As much as the impact of the pandemic is still unfolding as much as there is controversy regarding who is impacted and in which direction along with the main channels through which the impact of the pandemic is transmitted to FS. To arrive at a clear picture of how COVID-19 affects FS, the different transmission channels by which different aspects of FS are likely to be impacted are discussed below.

#### *Is the crisis supply side or demand side driven?*

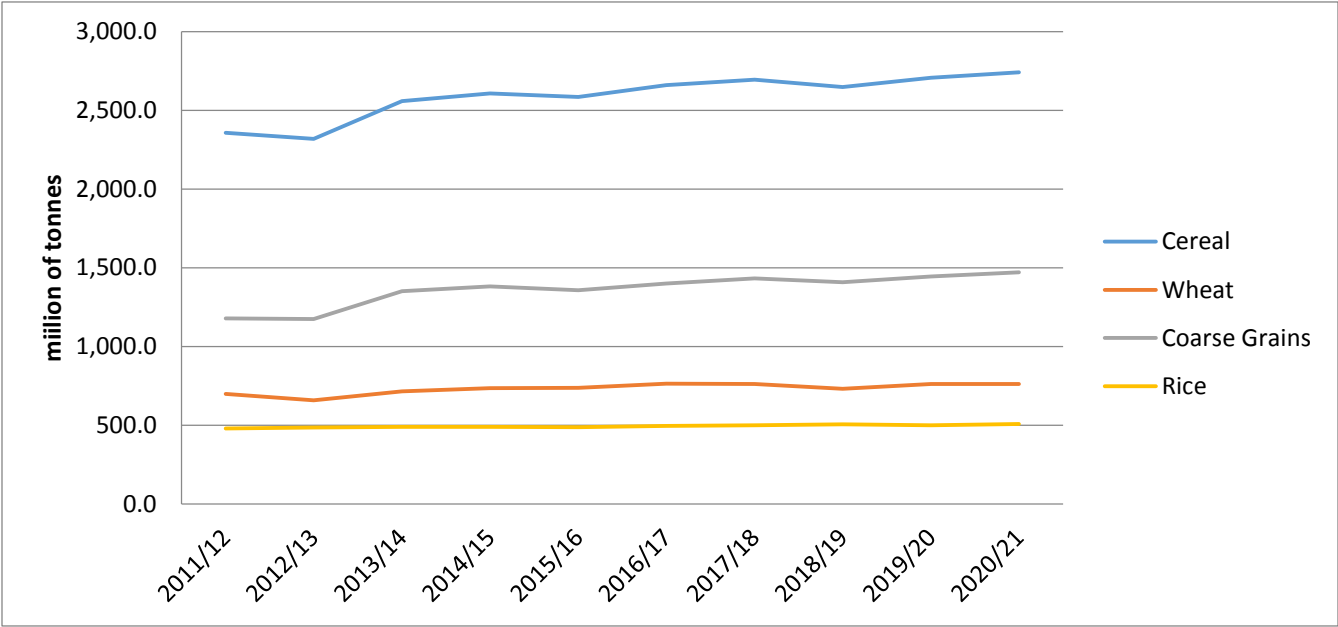
Despite the pessimistic forecast due to the aforementioned challenges, FAO (2020) identified that the production levels of the main food products, including wheat, coarse grains, cereals, and rice have remained relatively stable in 2020. The current global stock to utilization ratios are closer to their normal values implying no significant bottlenecks in the supply and demand aspects of the global market for main food staples (see Figures 2 and 3). As FAO (2020) emphasized, there is ample availability of cereals to meet global demand, and FAO forecasts a comfortable cereal stock-to-use ratio of 30.7% by the close of 2020.

Hence, so far the crisis seems not to be mainly supply side driven, especially when compared to the 2007/2008 crisis. In fact, the credit goes partially to the food crisis in 2007/08 as one of the main responses to it was the increase in staples' stocks in most of the countries especially developing ones. Thus, it is perceived that the availability pillar to be the least affected this time where the overall global picture of food world market seems to be comforting to a large extent as depicted by IFPRI (2020). Of course such generalization needs to be treated cautiously as the impact differs from one product to the other where cereals and grains are less affected compared to fruits and vegetables. Moreover, some analysts view the crisis to be relatively supply driven in high income countries (due to logistical bottlenecks and supply chain disruptions) and relatively demand driven in low income countries (due to loss of income and increased associated poverty) (Erokhin and Gao, 2020). Figures 2 and 3 identify that the global production patterns of major food commodities have remained relatively stable with no disruption effect from COVID-19. Moreover, cereals utilization has not been disrupted amid COVID-19. Despite the fact that the scene is changing gradually with the perpetuation of the pandemic where recent FAO projections are retreating from former declarations drawing some alarming signals within the availability pillar. FAO has amended its projections where the world cereal utilization in 2020/21 is now expected to increase by 1.9% from 2019/20, while at the same time worldwide cereal stocks are expected to decline, still with relatively comforting levels as



FAO noted<sup>8</sup>. However such new shifts in expectations should be seriously taken as negative trends can lead to drastic outcomes, where for example, it is now declared that global hunger could double due to food supply disruptions caused by the pandemic, especially in poor nations and Africa (Zurayk, 2020).

**Figure 2: Production Patterns of Food Commodity Products (2011/2012-2020/2021)**

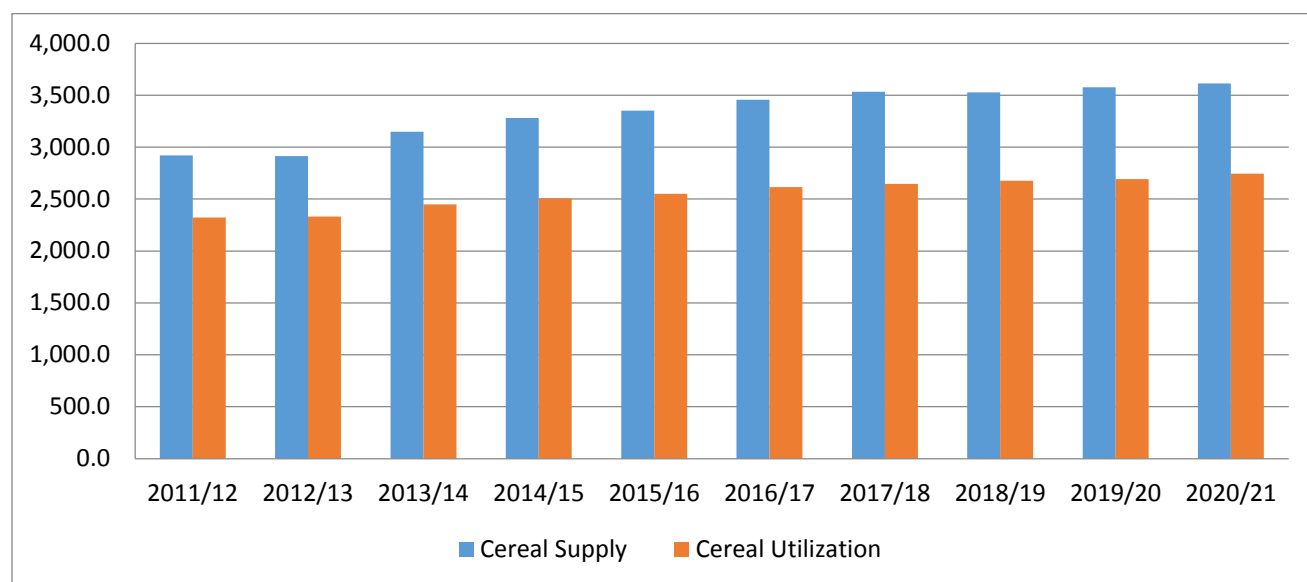


Source: Adapted from FAO (2020)

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<http://www.fao.org/news/story/en/item/1334280/icode/#:~:text=3%20December%202020%2C%20Rome%20%2D%20Global,United%20Nations%20report%20released%20today.&text=The%20FAO%20Cereal%20Price%20Index,higher%20than%20in%20November%202019>

**Figure 3: Production and Utilization of Cereals (2011/2012-2020/2021)**



Source: Adapted from FAO (2020)

*Is the crisis highly affected by supply chains' bottlenecks?*

The majority of the studies identified that the food supply chains to be the main vulnerable transmission channel prone to disruptions in this crisis. The effect of this channel differs according to the nature of product as identified by IFPRI (2020), from a low effect on basic staples as rice, wheat, and maize to more significant effects on fruits and vegetables that have a more complex supply chain on the global level (being perishable). Moreover, the effect differs according to the type of the product whether a final product or an input where final products are disrupted in a faster manner than inputs which react with a lag. In addition, the intensity of labor versus capital in the commodity production process is another factor where capital is less disrupted compared to labor which is affected by the pandemic and the associated precautions like lockdowns and confinements. The technology status, logistical facilities and level of economic development are all factors that result in variation of impact. This implies different impacts on countries according to the aforementioned variables but hinting towards a relatively harsher impact on developing countries compared to developed ones. Moreover, the disruptions are asymmetric in terms of global versus domestic value chains where global capital and technology intensive value chains are more resilient to the crisis when compared to domestic ones. The level of sophistication and diversification of risk for global value chains enable them to better address the challenges associated with interruptions in downstream and upstream channels of production (Amjath-Babu, 2020; Swinnen and McDermott, 2020). Supply chains concentrated in labor intensive segments represent a main pathway that affects FS. Global supply chains and those associated with high income countries have been more resilient because trade is mostly undertaken by large enterprises in coordinated and capital-intensive supply chains that can mostly adjust to disruptions geographically and temporally, and somewhat in product composition. These large trading companies can reduce risk and adjust to shocks as they are more flexible in switching global sourcing and destination regions and in diversifying and shifting stocks and providers

to manage risk. Within domestic value chains in developing countries, COVID-19 and lockdowns have mixed effects. Large scale companies are generally less labour intensive but rely more on hired labour (affected mainly by lockdowns), while SMEs are more labour intensive, but use more family labour (not affected by lockdowns). These different labour structures have influenced how resilient domestic value chains have been in the face of health challenges and social distance regulations (Swinnen and McDermott, 2020).

*Is the crisis a price driven or income driven one?*

On the demand side, the worldwide economic slowdown and consequently rising poverty and reduction of income levels accompanied with the extreme increases in unemployment rates, can result in a disrupted world food market and hence a worsening FS status (Schmidhuber et. al, 2020). While food consumption is generally inelastic with regard to income, large differences exist between high-income and low-income countries as well as high-income and low-income strata within countries. In low-income countries, or in poorer segments of high-income countries, income responsiveness is generally higher and aggregate food demand may contract. There are also considerable differences in income responsiveness across food items. Demand for food staples, such as grains, is generally less elastic than demand for fruits and vegetables or meat and dairy products. Poorer consumers will try to maintain a stable calorie intake and, in view of their over smaller food budget, shift away from more expensive and more nutritious foods, such as fruits, vegetables, meats and dairy products, to cheaper staples such as grains (Amjath-Babue et. al, 2020). In general, food demand in high-income countries is inelastic, safety nets are well developed, and governments have been quick to cushion possible hardships. Food demand in low-income countries, by contrast, is more elastic. Additionally, in the latter savings are generally lower and access to safety nets is limited, even without an additional contraction in GDP (Schmidhuber et. al, 2020).

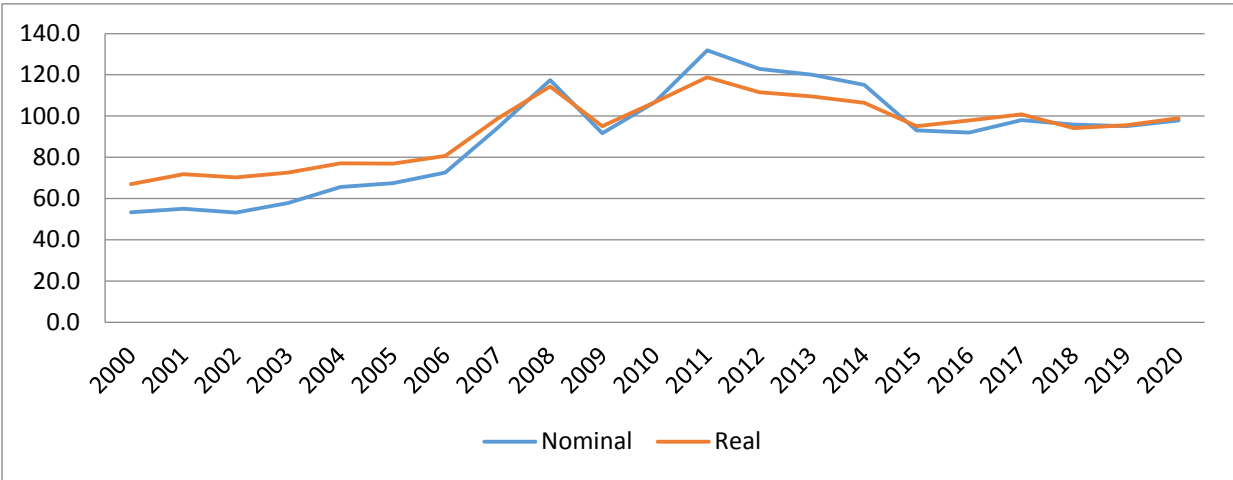
Regarding prices, from the beginning of the crisis till March 2020, the FAO Cereal Price Index was declining by 1.9 % compared to February 2020 and approaching almost the same level as in March 2019 (Figure 5). Large global supplies, combined with generally favorable crop prospects and low world energy prices, kept international wheat prices under downward pressure. The same trend applied on FAO Food Price Index which went down by 4.3% in March 2020 compared to February. The sharp decline in March was largely driven by COVID-19 pandemic-demand contractions. Nevertheless, since April 2020 there has been slight increases in the prices of the major food staples in the global market. As shown in Figures 4 and 5, price trends of major food commodities have been slightly increasing, but with no comparison to the price surges in 2007/2008 crisis. As depicted by FAO (2020), the rate of price increase over 2020 has been moderate where the FAO food price index recorded an increase of 2.9 points in 2020 compared to 2019 reaching a score of 97.9 points which is still below its peak of 131.9 points registered in 2011<sup>9</sup>. However, more recent price changes rendered the picture more worrisome where world prices trends are changing. Global food commodity prices rose sharply in November 2020 to their highest level in six years where FAO Food Price Index increased by 3.9% compared to October 2020 and 6.5% from November 2019. The rise continued in December 2020 by additional 2.2% rendering the FAO Food Price Index to record a high of 107.5 points in December 2020, hence registering the sharpest increase since July 2012.

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<sup>9</sup> <http://www.fao.org/worldfoodsituation/foodpricesindex/en/>

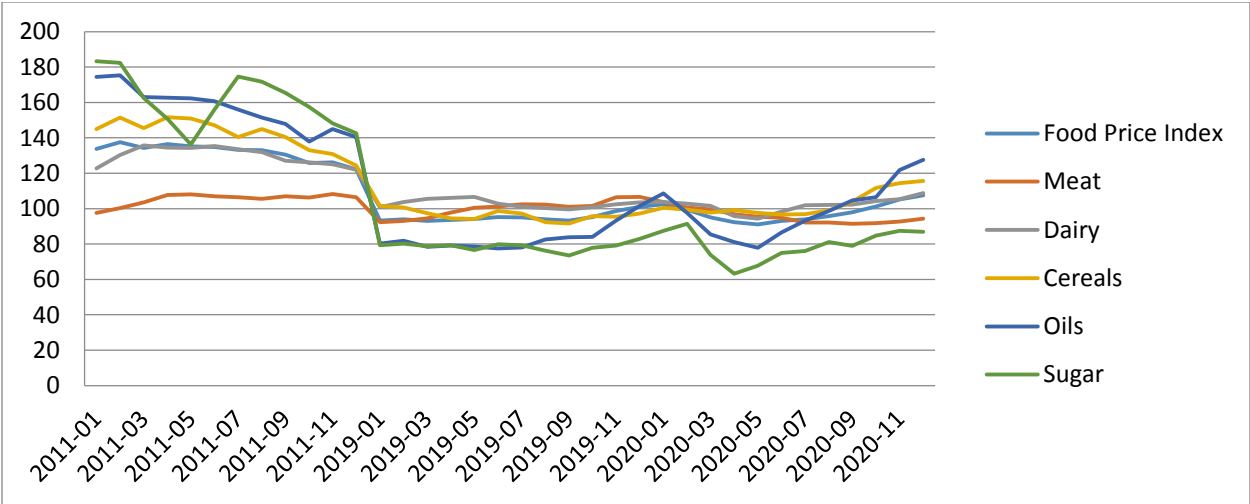
In spite of such recent increases, price does not seem to be the major culprit underlying this crisis. The expected decline in incomes of the different income groups, and especially the informal sector and vulnerable poor segments of the society represent a major risk on the demand side, especially that the estimates of the expected slowdown in the world economy is substantial (Erokhin and Gao, 2020). While neither the final income nor price impacts are clear at this stage, on one hand the strong recessionary wave associated with the recent price hikes puts the accessibility pillar under jeopardy. On the other hand, the relative availability of food staples and the greater exposure of labor intensive food products such as vegetables and dairy products to adverse effects emanating from this pandemic, suggests a deterioration in the quality of the diet adversely affecting the utilization pillar (Schmidhuber et. al, 2020)

**Figure 4: Annual Nominal and Real FAO Food Price Index FAO (2014-2016=100) from 2000 till 2020**



Source: Adapted from FAO <http://www.fao.org/worldfoodsituation/foodpricesindex/en/>

**Figure 5: FAO Monthly Commodity Price Index (2011 and 2019-2020)**



Source: Adapted from FAO <http://www.fao.org/worldfoodsituation/foodpricesindex/en/>

### *Is the crisis different from the 2007/2008 crisis?*

There are many respects in which COVID-19 crisis differs significantly from 2007/2008 food crisis having implications for FS. The 2007/2008 crisis was triggered by different reasons when compared to the COVID-19 crisis. The former was associated with high fuel prices and was mainly a food crisis where responses by governments escalated its deepness (e.g. by imposing trade restrictions which triggered world prices). The latter is a byproduct of a health and subsequently an economic crisis where trade policies were also resorted to but still have not dominated the scene as a major response. The former was mainly supply driven accompanied by wrong and egoistic government interventions which led to skyrocketing of prices of food staples in the world market (Pinstrup-Anderson, 2015). The pandemic crisis suffers from both supply and demand aspects where demand plays a more significant role and problems associated with supply chains and logistics being at the core of crisis.

Food price spikes within the 2007/08 food crises has hurt consumers but benefited farmers, yet the pandemic resulting in value chain disruptions is expected to hurt both consumers (with less urban supplies and higher prices) and producers (with less farm-level demand and lower prices) (Swinnen and McDermott, 2020). The 2007/2008 food price crisis showed that the panic about food availability and trade restrictive policy responses can have detrimental effects where such responses triggered almost 50 % of the price surge. Even food importing countries at that time worried about the higher cost of food, in turn, lowered import tariffs on food, supporting demand but keeping upward pressure on world prices. As a result, instead of containing price increases, these policy responses only drove world market prices higher (Glauber et. al, 2020).

Most of the negative impacts of the pandemic on FS can be ironically attributed to the opted rescue measures undertaken by main food exporters and importers to contain such adverse impact of the crisis per se. It does not seem that countries have learnt the lesson from the previous crisis where some countries followed the same suit like household hoarding behavior in response to the pandemic and opted for more trade restrictions in an essence to achieve food sufficiency putting FS aside. Some countries have started imposing export restrictions which could disrupt the global markets even if imposed for a temporary period of time. Examples include Kazakhstan suspending exports of several cereal products, as well as oilseeds and vegetables, and Viet Nam stopping suspending the issuing of rice export licenses. Russia is following suit and announced that it will ban wheat exports. Kazakhstan is not a major wheat exporter (3% of the global wheat exports) and hence its restrictions are not likely to affect the world market. However, Russia is a major wheat exporter and Viet Nam is a major rice exporter, and hence their actions are likely to disrupt the world markets. The fear is that other countries follow suit and apply the same measures which can have substantial drastic effects on the world food market, and consequently FS status (Erokhin and Gao, 2020; Udmale et. al, 2020). Such binding restrictions amid COVID triggered food supply shortages and affected around 5% of globally traded calories compared to 19 % in 2007-2008 crisis<sup>10</sup>. Though this figure (5%) might look insignificant, a retaliation effect might continue to take place which could further deepen the crisis. It is currently expected that current export bans could last longer as the pandemic is still ongoing and major food exporters are still fighting the pandemic (Fan et. al, 2020). Yet, It might be the case if the

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<sup>10</sup> <https://www.ifpri.org/project/covid-19-food-trade-policy-tracker>

world food 2007/2008 crisis had not occurred, countries would have been in a much worse position facing COVID-19 crisis as now they are already prepared regarding availability and have a kind of emergency plan to partially contain the panic.

In a nutshell, COVID-19 crisis is likely to affect the accessibility and utilization pillars of FS in a more significant manner than affecting the availability pillar. Its main channels are disruptions of local value chains and demand side. Its impact on the demand side arises from being income induced and not price driven. It differs significantly when compared to 2007/2008 crisis.

## **Section Two: Food Security in MENA and Potential Impact of COVID-19 Crisis**

### **2.1. Status of Food Security and COVID in MENA**

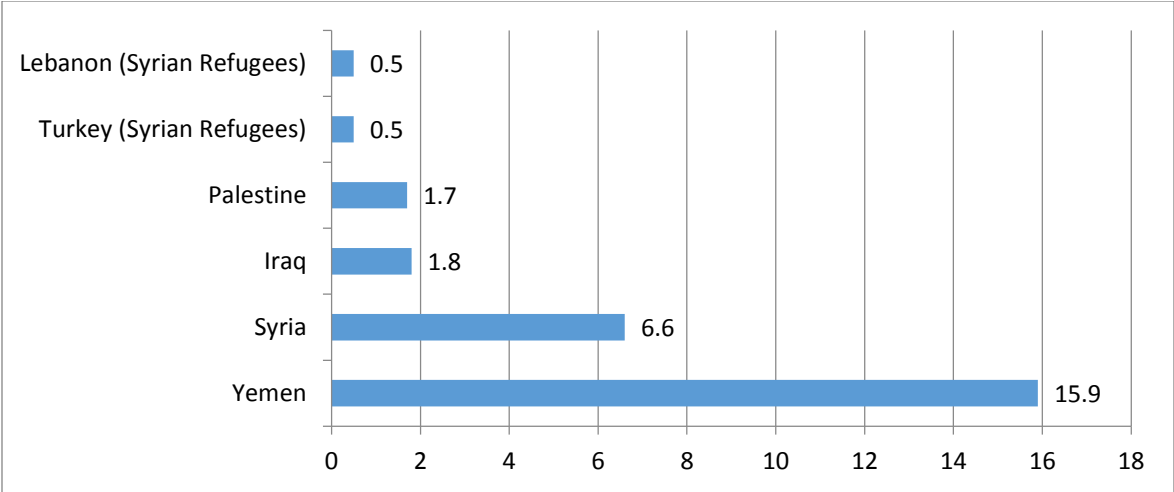
Initial pre COVID FS prospects within the MENA region are not comforting. A number of countries in the region are highly vulnerable and their status of FS has been worsening over time. The region as a whole is among the largest world food importers where on average each country imports more than 50% of the calories it consumes. The utilization is the weakest FS pillar in the region where around 52 million people suffer from obesity and other food related diseases as diabetes (Karasapan, 2020). Moreover, the region includes two of the ten top countries in the world enduring highest severity of food crises amounting to 53% of the population in Yemen and 36% in Syria (GRFC, 2020). Along with Yemen and Syria; Iraq, Libya and Palestine experience one of the alarming conflict-related humanitarian emergencies (FAO, 2020). This brings conflict and instability as main triggers of FI in the region (GRFC, 2020). According to the Global Hunger Index (GHI), Yemen and Syria reached extreme alarming scores (35-49.9)<sup>11</sup>, followed by Iraq (17.1) and Egypt (11.9) having 2 digit hunger index scores and classified as moderate degree of risk yet still high (See Table 2 in Annex). In other countries like Lebanon and Turkey as well as Jordan, refugees face also severe degrees of FI, Figure 6. Gulf Cooperation Council (GCC) countries are home for huge number of migrant workers, forming a considerable percentage of the population exceeding 80% in the United Arab Emirates (UAE) and 70% in Qatar and Kuwait, and 30% in Bahrain, Saudi Arabia and Oman (Woertz, 2020). This substantial category of the population faces several degrees of discrimination where they are not covered by subsidy schemes as normal citizens and are deprived from basic labor rights. Above all, the living conditions of the majority hamper them from attaining the minimum requirement for notorious food (Woertz, 2020). All this puts their FI status at the edge. Both segments of the population, migrant workers and refugees, “the invisible martyrs of the food system”, as named by Zurayk (2020), are subject to alarming FI levels. Furthermore, Lebanon has been currently facing political and macroeconomic severe crises where the soaring public debt is placing strain on foreign currency reserves and leading to reduced capacity to import essential goods including food. Moreover, the depreciation of the currency by more than 63% from October 2019 to February 2020 hence eroding the purchasing power of the population and moving a large segment of the population to poor and near poor status (GRFC, 2020). The situation is also bad in other countries where 9% and 6% of the population in Iraq and Libya respectively require food assistance (Karasapan, 2020; Ling Ma et. al, 2021).

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<sup>11</sup> <https://www.globalhungerindex.org/ranking.html>

The relatively limited arable land in the region is also a main problem factoring in and adding more complexity to the FS issue. Only 30% of the land in MENA is suitable for agriculture. Moreover, all MENA countries suffer from extremely high levels of water stress or high levels of water stress (Karasapan, 2020). Such water poverty puts FS under significant stress. Moreover, the policies adopted by the majority of MENA governments have exacerbated the problem of FS where generous cheap water was provided and at the same time food consumer subsidies (with unhealthy diet and nutrition) has been a main policy tool (Karasapan, 2020; Woertz, 2020).

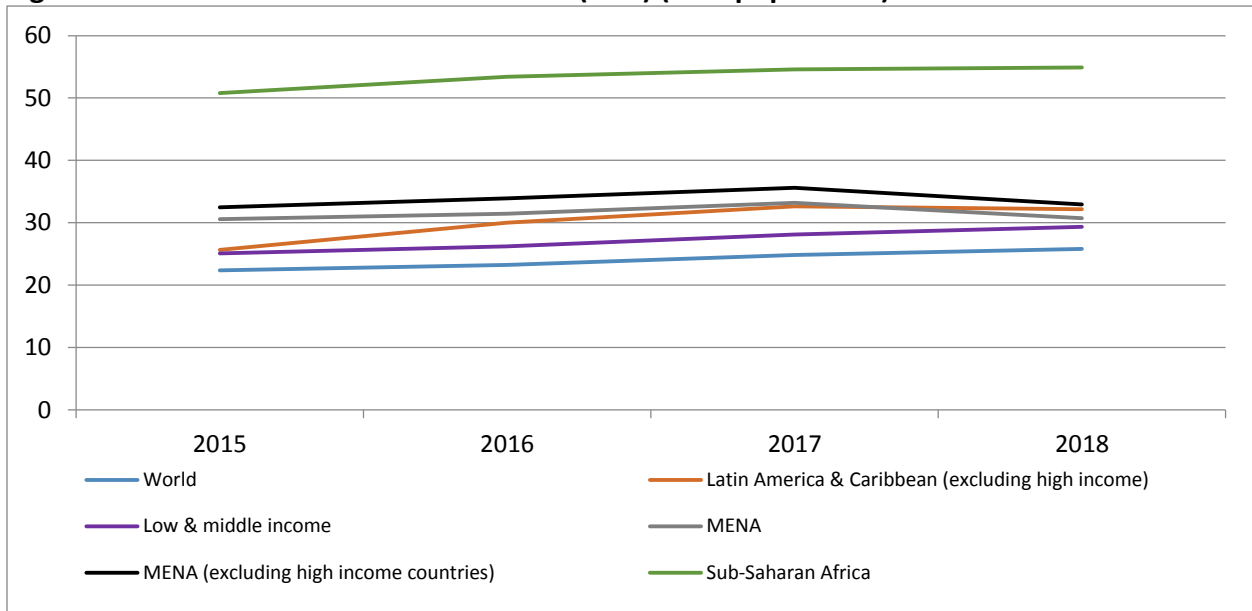
**Figure 6: Number of Acutely Food Insecure People (million)**



Source: GRFC (2020)

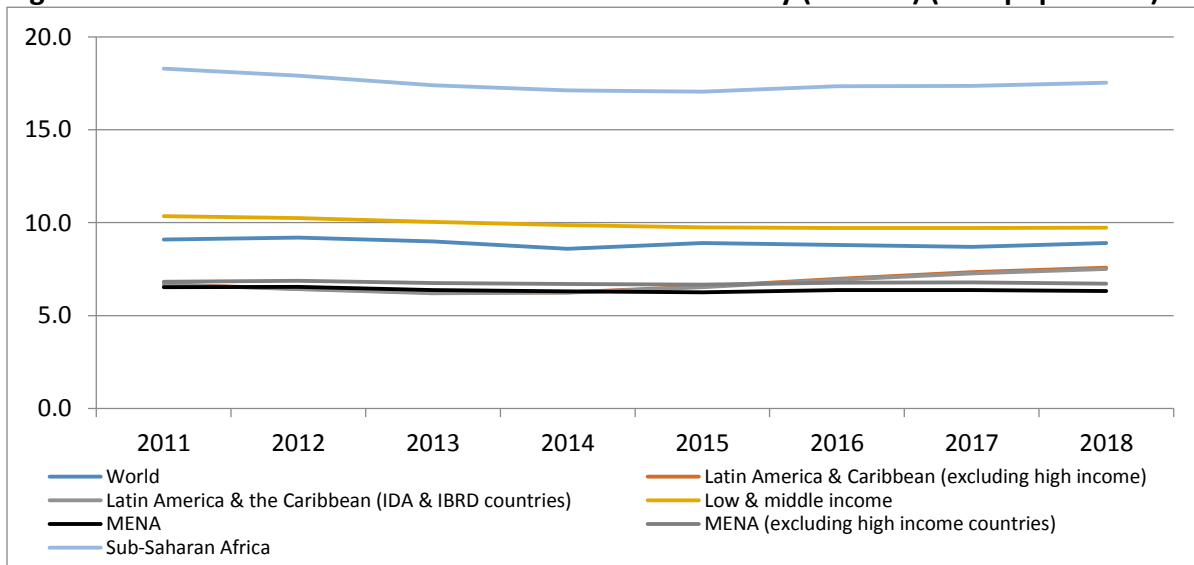
Focusing on other one-dimensional FI measures, the picture is mixed. Whereas the region holds lowest percentages for moderate or severe FI compared to the world and other low and middle income economies, yet it has been on a rising trend since 2015. On the other hand, MENA countries come after the Sub-Saharan countries with highest prevalence of undernourishment yet has been declining since 2017 (Figures 7 and 8).

**Figure 7: Prevalence of Undernourishment (PoU) (% of population)**



Source: Adapted from WDI (2020)

**Figure 8: Prevalence of Moderate or Severe Food Insecurity (PoMSFI) (% of population)**



Source: Adapted from WDI (2020)

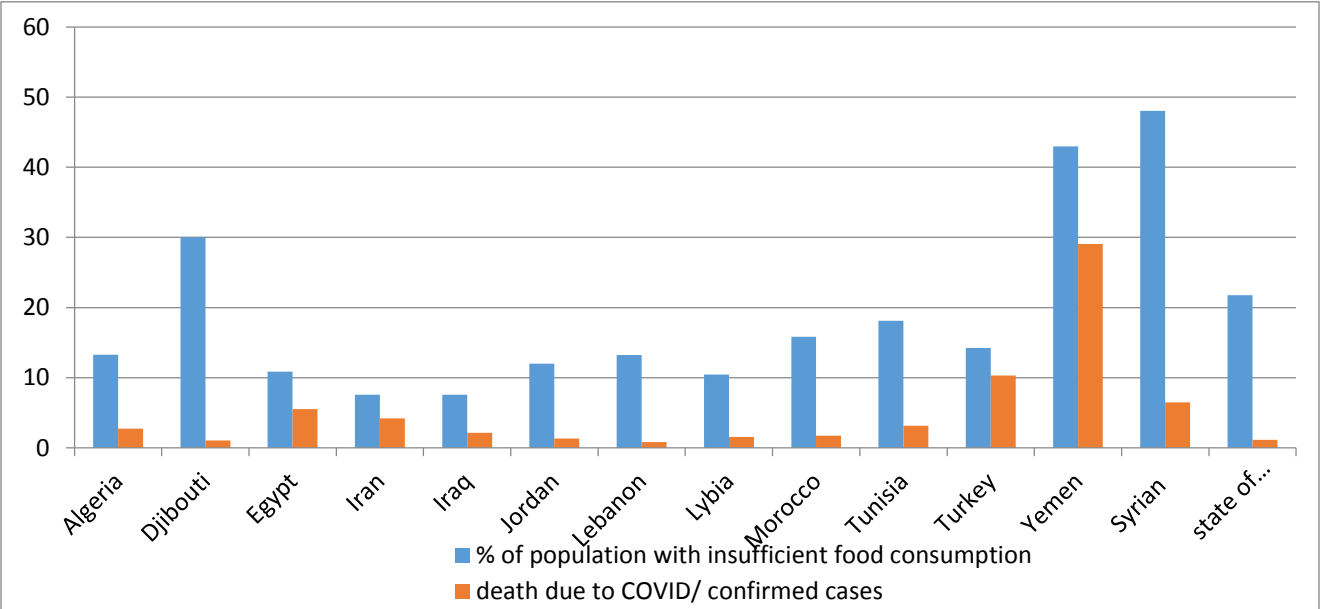
To get a more comprehensive understanding of the situation, the scores of the GFSI are analyzed (Table 1 in Annex). Again Syria and Yemen have remained on the tail of the list in the overall score of GFSI as well as within each pillar. High income countries in the region, GCC countries and Israel, score the highest in the affordability and utilization pillars (except for Bahrain) and relatively low in the availability dimension where Israel, Egypt, Turkey and Morocco come as best performers in this pillar in the region. Israel is the only country in the region which holds relatively high scores in all dimensions. On the global level, Tunisia, Algeria and Yemen were among the 10 most deteriorating



countries whereas Kuwait and Qatar were among the best 10 improving countries worldwide. The EIU index is largely in line with Omdivar et. al, (2019) who classified MENA countries in four clusters. The first cluster enjoys a high level of FS with relative political stability included the six GCC countries in addition to Lebanon. The second cluster included mainly middle income countries with low stability and moderate FI levels whereas the third included low and middle income countries with high degree of instability and alarming FI levels.

With the prolongation of COVID-19 pandemic, FS is brought under extreme scrutiny in MENA. Between October 2020 and January 2021, the number of people with insufficient food consumption increased in Algeria, Egypt, Libya, Morocco, Tunisia and Turkey (Table 1).

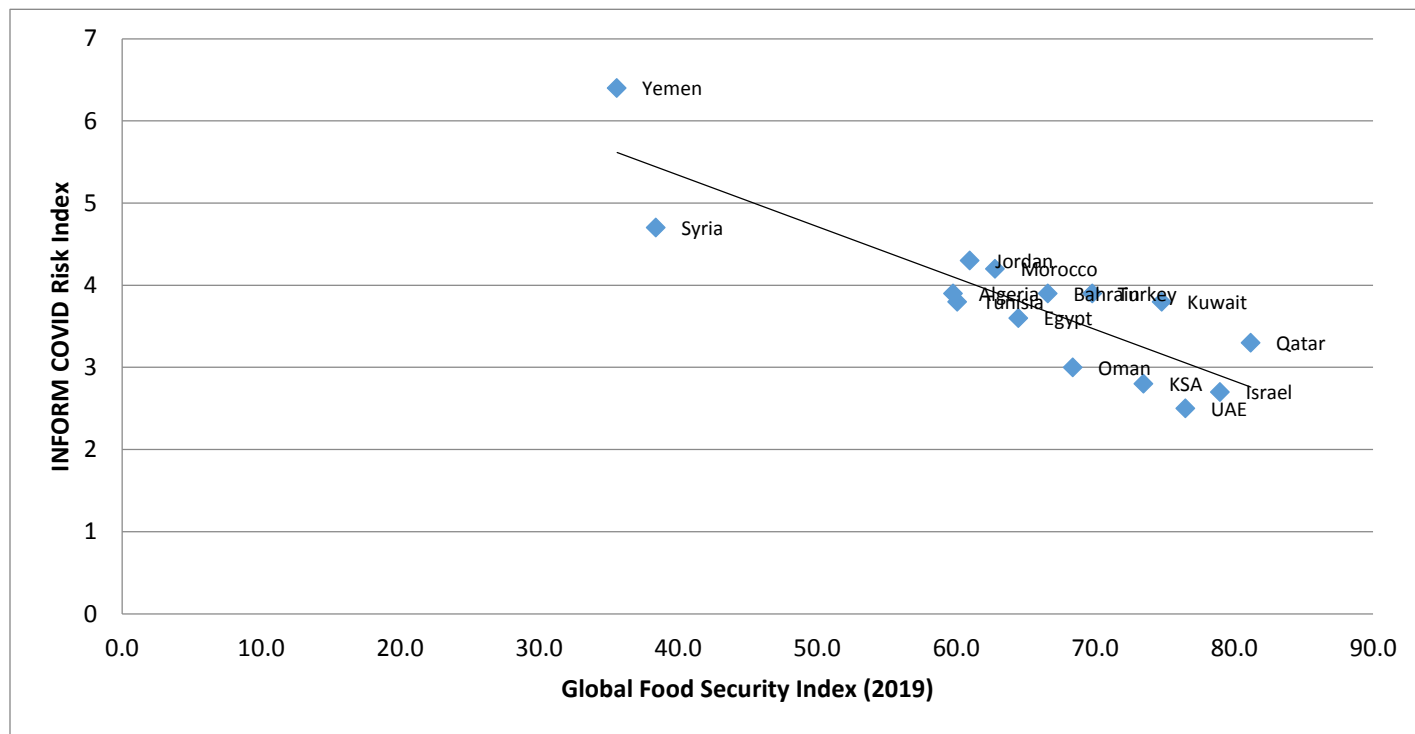
**Figure 9: % of Population with Insufficient Food Consumption and Intensity of COVID as of January 2021**



Source: Adapted and calculated from World Food Program WFP (2021)

As Erokhin and Gao (2020) mentioned, MENA region is among the highly vulnerable regions in the world together with Sub Saharan Africa and Latin America to people being subject to suffer from acute hunger amid COVID-19 crisis. The pandemic is highly expected to magnify the pre-existing vulnerabilities in MENA countries suffering from domestic and regional conflicts where the combination of weak institutions with disruptions to food supply chain and food aid will deepen the crisis (FAO, 2020). It is worth noting that food aid is vital for some countries where 50% of the population in Yemen and Syria is dependent on food aid (Karasapan, 2020). The highest fatality rates within COVID confirmed cases occurred in Yemen, Turkey, Egypt and Syria (Figure 9 and Table 2 in Annex). In the same manner like Figure 1, Figure 10 shows a negative relationship, within the MENA region, between the countries’ ability to handle the pandemic according to their demographic, economic and institutional rigidities as expressed by the INFORM COVID-19 risk index and food security as measured by GFSI.

**Figure 10: COVID-19 Readiness Risk Index (INFORM COVID Risk Index) and Global Food Security Index in MENA Countries**



Source: Adapted from Poljanšek et al. (2020); EIU (2020)

**Table 1: Food Insecurity in MENA Region amid COVID-19 (excluding high income countries)<sup>12</sup>**

	People with insufficient food consumption (January 2021)	% of Population	People with insufficient food consumption (October 2020)
Algeria	↑5.6	13.3%	5.34
Djibouti	0.3	30.0%	0.38
Egypt	↑10.7	10.9%	10.64
Iran	6.2	7.6%	6.62
Iraq	2.9	7.6%	3.27
Jordan	1.2	12.0%	1.25
Lebanon	0.9	13.2%	0.94
Libya	↑0.7	10.4%	0.65
Morocco	↑5.7	15.8%	5.24
Tunisia	↑2.1	18.1%	1.81
Turkey	↑11.7	14.2%	10.91
Yemen	12.9	43.0%	13.01
Syria	9.8	48.0%	9.12
Palestine	1	21.7%	0.99

Source: extracted from WFP (2021)

## 2.2. Channels of Transmission of COVID-19 Impact on FS in MENA Region

The pandemic has been generating a set of disruptions that would be transmitted to FS within the region via various channels.

### *Economic downturn, poverty is on a rising trend, arable land is limited, and water is scarce*

There are direct channels as well as indirect transmission channels by which the COVID-19 crisis is likely to affect FS in MENA countries. Among the direct channels is the slowdown of the world economy and its expected repercussions. According to the World Bank Group (2020), a downslide in the economies of the region is expected to be by 5.2% in 2020. Such projections are constantly revised bringing up more pessimistic trends on the scene. According to World Bank (2021) projections MENA's collective GDP is expected to contract further by 7.6 percentage points in 2021. At the country level, the World Bank (2021) calculations registered the highest expected GDP losses in Lebanon, reaching a decline of 30% followed by Yemen and Iraq with a descend of about 15% then Kuwait, Oman, UAE and Tunisia with an average of 9%. Algeria and Morocco follow by 8% while Egypt holds the least downgrade in the region reaching 4.6%. The 2021 forecast for recovery is also dim where countries' GDP is expected to remain below their pre-crisis level (World Bank, 2021).

<sup>12</sup> The table excludes GCC countries as well as Israel since they do not suffer from a significant undernourishment problem and thus are not covered by the World Hunger Map (WFP, 2021).

The twin shock of COVID and declining oil prices is expected to hurt countries unevenly where the World Bank (2021) projections revealed that conflict countries and oil exporters are the most severely affected countries (Yemen, Iraq, Libya, and Syria), followed by the GCC and oil importers. Oil importers are those MENA countries suffering from large fiscal deficits and high cereal import dependency (e.g. Jordan and Lebanon) whereas the GCC countries are cushioned by a better fiscal position enabling them to absorb the increasing costs, albeit being fully dependent on wheat imports and facing simultaneously dwindling world oil prices for their major export good (Larson et. al, 2012). The declining oil prices have negative potential impact on other variables including investment, remittances and aid flows. For example, remittances were projected to drop by 20% in 2020. Further, in 2020 FDI to GCC declined by 20.2% whereas in non- GCC MENA countries it fell by 74% compared to 2019 (World Bank Group, 2020). This would indeed magnify the recessionary impact of the pandemic to an extreme level that would be transmitted to FS on the affordability as well as the utilization pillars.

Moreover, according to the World Bank (2020) the agricultural output in MENA is likely to be negatively affected (3% reduction) equivalent to the manufacturing, yet less severe than services (9.3%) (World Bank Group, 2020). The reduction in output is likely to imply reduction in employment where most of the agriculture in MENA countries is dominated by small scale agricultural producers and informal sector. On the other side, the purchasing power of this poor and vulnerable segment is expected to decline which will negatively affect FS from the supply and demand sides.

Focusing on local production, prospects differ significantly among MENA countries. For example, drought has significantly affected Maghreb countries (Morocco, Algeria, and Tunisia). All three countries produce mostly rain-fed cereals. As a result of the drought wheat production in Morocco was expected to be reduced by 50% of the country's average in 2020. Yet, all three countries have adequate cereal stock. In other countries, as Syria and Iraq, weather conditions remain favorable, however the agricultural production is disrupted by the domestic conflict they have been experiencing for a relatively long time. The prospects for grain availability in the coming months are relatively good in Egypt, the world's largest importer of wheat, providing enough grain to meet national demand for several months (FAO, 2020).

Anecdotal evidence suggests that COVID-19 has significantly negatively affected the status of FS in a number of MENA countries. For example, World Bank Group (2020) shows that the Tunisian population suffered tremendously where 18% of the households consume less food and the poorest quintile reduced its food consumption fivefold amid the crisis despite the availability of a number of social protection programs. The same is true for Libyan population, yet in a more drastic manner, where 70% of the households consume less food. (Erokhin and Gao, 2020; World Bank Group, 2020). In Jordan, agriculture was most of the highly affected sectors by the crisis due to lockdown measures which resulted in shortage of labor. Yet, the most significant loss was incurred by the food services sector (namely hotels and restaurants) which is expected to suffer losses reaching over 90% (Raouf et. al, 2020). Breisinger et al., (2020) found that the crisis's effect on FS in Egypt is significant. The negative impact is channeled mainly through the economic damage affecting the food services sector which is likely to suffer significant losses exceeding 50% and indirectly affecting the food processing industry, yet with less severe effect. However, the agriculture sector, as a component of agri-food

system, remained resilient with an expected increase in output of around EGP 3 billion. Moreover, the agricultural sector is not likely to experience reduction in production for all crops, but is likely to experience an increase in wheat production due to higher government procurement prices.

Such disruptions have led to price increases in the MENA region which negatively affects the accessibility pillar of FS. Since February 2020 the prices of main food categories in the region have been on the rise including those for carbohydrates, dairy, fruits, meats and vegetables. Yet the price increases have been moderate ranging 5% on average for the majority of food products with an exception of food staples where price increases reached 20% and more since February 2020 in several countries including Djibouti, Egypt, Iran, Kuwait, Lebanon, Morocco, Qatar, Saudi Arabia, Syria, and Yemen. (World Bank, 2021).

From another highly related perspective, poverty has been highly rooted in the region with an estimated 20.3% in 2018 rising by 33% compared to 2015 (WDI, 2020). The general prospects for growth in the region remain dim where the IMF has made its lowest forecasts for the region in 50 years (UNSDG, 2020) hence deepening the poverty aspect. The current crisis is estimated to increase the poor in the region by 14.3 million to reach 115 million people by end of 2020 (UN, 2020a). The recent World Bank poverty projections due to COVID are even gloomier where the rate of increase in poverty is expected to range from 15% to 100% as depicted in Table 3 in Annex (World Bank, 2021). In such a situation, it is expected that the COVID-19 crisis is likely to exacerbate the already existing extremely vulnerable FS situation (FAO, 2020).

As discussed in *Section One*, the effects of COVID and the resulting downturn are highly uneven, with effects being substantial on the poor and vulnerable groups (including casual workers, informal sectors, etc.) Moreover, the crisis' effects are uneven in their sectorial impact where some sectors have been harshly hit when compared to others (including tourism and readymade garments industries). Hence, people working in such sectors are likely to be more negatively affected than people in other sectors. Such sectors are of extreme economic importance for several countries in the region especially in terms of employment effects implying that the negative impact is likely to be substantial on loss of income, poverty, and hence FS (among such countries are Egypt, Morocco, Tunisia, and Lebanon) (World Bank, 2021; World Bank Group, 2020).

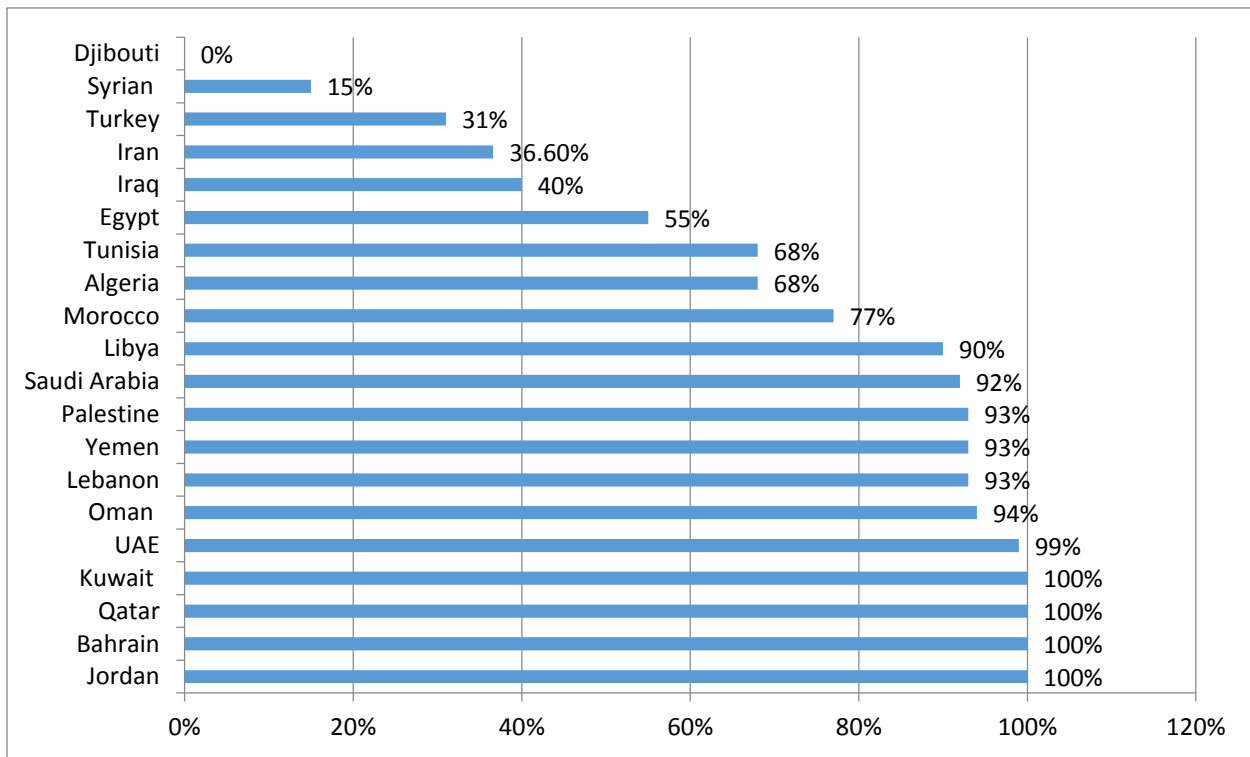
### *Political Instability and reluctant reforms*

Among the three main pillars of FS, namely two (availability and affordability of food) were always among the slogans that were raised during the different uprisings that started in 2010 onwards, indicating the severity of the problem and its historical political and economic dimensions. Paradoxically, the existing regimes before the uprisings have had food subsidy programs enacted, however, were not capable of ensuring FS in reasonable terms to their citizens. Political instability has a direct link to FI in various dimensions. For example, encroachment of urbanization on agricultural land in Egypt intensified in the aftermath of January 2011 revolution making use of the weak subsequent governments, lack of security, and absence of rule of law. About 62,000 hectare of agricultural land was lost in the 3 years after the revolution, a two-third increase than the normal annual loss bringing up extreme pressures on FS (Mandour, 2017).

### *International Trade:*

Trade is a vital channel through which COVID can significantly affect FS. The fact of being highly dependent on food imports exacerbates the FI status in the whole region. The region is the largest importer of cereals globally, where GCC countries (excluding Saudi Arabia) import 100% of their cereal needs, and countries as Jordan, Oman, Palestine, Yemen, Saudi Arabia, Libya and Lebanon import more than 90% of their grain needs, Figure 11. Such high import ratio makes such countries prone to any distortion in world food prices, currency volatilities and food availability shocks (Mouldji et. al, 2020).

**Figure 11: Import dependency Ratio <sup>13</sup>(Cereal)**

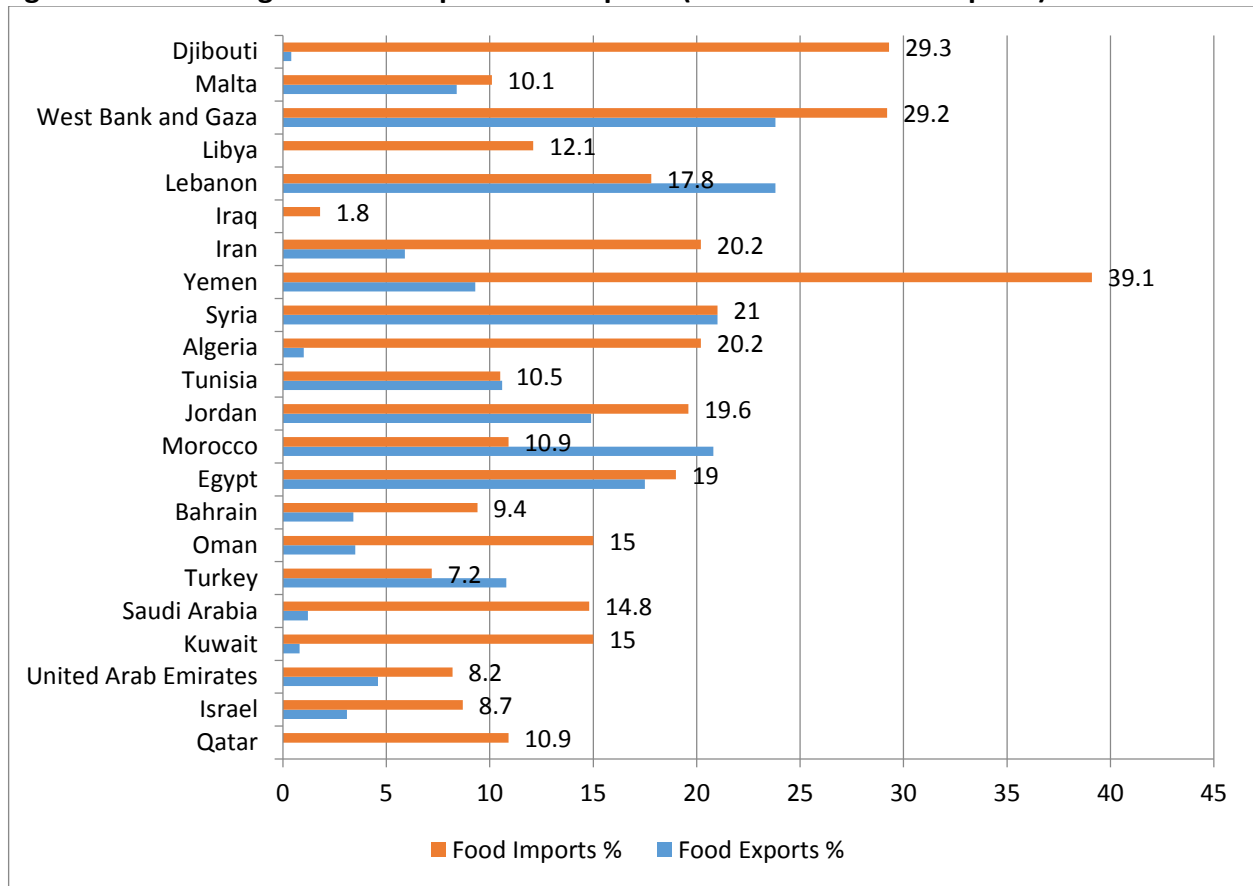


Sources: Adapted from WFP (2021); FAO (2020), and FAOSTAT (2020b)

A number of MENA countries depend highly on exporting a number of food exports exceeding 20% in Morocco and Lebanon, Figure 12. Such products also constitute a significant share in other countries like Egypt, Turkey and Jordan (WDI, 2020). Depending on food exports among which are highly perishable ones imply more vulnerable exposure to supply chains and logistics' disruptions (FAO, 2020). Further, such countries are expected to face a further decline in their food exports following the recessionary impact of the crisis which is expected to lead to foreign demand contraction for their exports which are relatively highly price and income elastic.

<sup>13</sup> Percentage of a country's imported food for domestic supply versus its own food production for domestic supply; it is calculated as follows:  $IDR = \text{Imports} / (\text{local production} + \text{imports} - \text{exports}) * 100\%$  (WFP, 2021)

**Figure 12: Percentage of Food Imports and Exports (% of merchandise imports) in 2019**



Source: WDI (2020); <http://wdi.worldbank.org/table/4.4#>

Other countries in the MENA which depend heavily on exporting hydrocarbons are likely to experience a decrease in price of their major export commodities (mainly oil exports) which will in turn have a negative impact if price of staple food commodities continued to increase (Erokhin and Gao, 2020). This implies that the impact on the balance of payments is expected to be negative especially if the world prices of agricultural products continued to rise (Schmidhuber et. al, 2020). Woertz (2020) classified those countries to be the most vulnerable to trade-COVID induced disruptions being also poor in natural resources as well agricultural potential. Although the GCC countries’ scores within the FS utilization pillar, as measured by GFSI (Table 1 in Annex), are relatively high, such countries holds the largest per capita shares worldwide of people suffering from diabetes and obesity (Woertz, 2020). It is worth mentioning that the GFSI has a major shortcoming in that respect as it does not cover a number of malnutrition and health related indices. Nevertheless, the food systems of the GCC countries have so far performed well during the COVID-19 crisis in terms of ensuring food availability. Their modern value chains are more resilient than the traditional and transitional ones that dominate in developing countries (Woertz, 2020). In other MENA countries where the government plays a vital role in the procurement, storage, and distribution of main food products like wheat, the impact of the crisis on FS has been contained (e.g. Egypt) (Larson et. al, 2012).



### *Tourism*

One of the indirect transmission channels affecting FS is the slowing down of tourism in MENA region. Tourism is a main activity in a large number of MENA countries whether in terms of contribution to GDP or as a main direct and indirect employer (e.g. UAE, Tunisia, Egypt, Saudi Arabia, Jordan). For example, tourism constitutes a major contributor to GDP and employment in several MENA countries as Egypt, Morocco, Tunisia, and Lebanon (FAO, 2020; Ghoneim, 2020). The slowing down or rather the complete stop of tourism could have severe repercussions on the food supply chain associated with hotels and restaurants, which have negative impact on food suppliers. Moreover, the cutting down of salaries and employees in the tourism sector, being a large employment sector in MENA, and especially for the casual workers, could also have serious repercussions on the demand for food which again is likely to disrupt the food supply value chain. According to some estimates the losses of tourism can constitute two thirds of the total losses incurred by MENA countries due to the pandemic (OECD, 2020; World Bank Group, 2020).

To wrap up, availability might not be radically affected in the region today but with the continuation of the pandemic along with its a drastic recessionary impacts and escalating disruptions in the global and local supply chains could have considerable impacts on availability, accessibility and harshly on utilization in the very near future. Such potential shifts would have a dual effect on FS. The first effect arises from its direct negative impact on FS by shifting from healthy to less healthy food products, hence, exacerbating the FI in the region. The second effect is the indirect effect arising from negatively affecting the food trade balance since MENA countries export the high elastic food products (e.g. fruits, vegetables) and import the lower elastic food product (e.g. wheat, and grains). Hence the ability of the governments to ensure FS is expected to be weakened. Adding to that that the MENA region is highly dependent on exports of hydrocarbons (Schmidhuber et. al, 2020), which suffered another type of crisis due to the price war between Russia and OPEC, and given the worldwide slowdown, fuel prices are foreseen to suffer from a declining trend. This is likely to affect the balance of payments of the majority of MENA countries which either export hydrocarbons, import low elastic food staples, and export high elastic food products. Given the fact that a number of main producers of wheat and grains have started imposing export restraints as mentioned in *Section One*, the negative impact of the COVID-19 crisis is likely to be exacerbated. Conflict countries and LDCs are more vulnerable than other countries, but so as well are countries heavily depending on oil and/or food exports. This implies that the majority of MENA countries are highly vulnerable countries to the crisis. Table 4 in Annex illustrates the main sources of risk that countries in the MENA region could be exposed to due to the pandemic (FAO, 2020).

### **2.3. Policy Responses in MENA Countries**

Similar to the global trend, food crisis 2007/08 and the foresighted measures taken at that time to mitigate its impact was a main savior for MENA region at least during the early phases of the pandemic. Some of the measures taken to confront and mitigate the repercussions of COVID on the food system were reactive (mainly trade protectionist and social safety measures) and some were proactive (storage policy in the majority of MENA countries and shifting to modernized capital intensive value chains in a minor set of countries). Among the mitigating measures undertaken were expanding the cash transfers, consumer subsidies. Such measures helped to smoothen the expected potential price and income fluctuations in general and for food in specific (World Bank Group, 2020). Among the proactive measures has been increasing the storage capacity. Several MENA governments have learnt to add to their capacity of storing main food staples since the 2007/2008 crisis. This resulted in increasing the share of the global stock of the main food staples in the region and significantly increasing the stock-to-use ratio. (e.g. from negligible levels in the 1970s to more than 13% of global wheat stock by the end of the first decade in 2000s) (Larson et al., 2012). All this accompanied with the favorable weather conditions for their major cereals and grains has set MENA region in a relatively stable position despite the Maghreb countries being subject to drought and above average weather temperatures as well as conflict in Syria, Yemen, Iraq, and Libya (FAO, 2020). This had helped radically in releasing the stress on the availability pillar in the region.

Along the same orientation of putting self-sufficiency as a main target, a number of countries in the region adopted trade protectionist measures aiming at enhancing food imports or restricting/banning some food exports (Table 5 in Annex). Yet, the severity of such measures, and especially the export bans decreased over time.

Some MENA countries have dedicated extra attention to food aspects amid COVID-19 crisis, among which are Egypt (see Box 1 for measures adopted in Egypt) and Lebanon (special banking arrangements for importing food). The GCC countries have managed the crisis well so far, not through a reactive response policy but rather a proactive one. They have focused mainly on managing the supply chains and international linkages in an effective manner. Following Woertz (2020) and FAO (2020), they have increased storage capacity, diversified their importing sources, relaxed import procedures (e.g. relaxing the condition of Arabic labels), and streamlined sanitation measures. Woertz (2020) also identified it is time for MENA countries in general and GCC countries in specific to shift their major focus from food availability to food accessibility and utilization. The former efforts in MENA countries have left those two dimensions of FS lagging behind.

**BOX I: Measures taken to shield domestic food markets in Egypt**

Egypt has ample food supplies to help shield its domestic market from short-term global supply risks associated with the COVID-19 crisis. As of April 2020, Egypt has already imported substantial quantities to cover its needs for the year, particularly wheat. It has, over the years, doubled its modern grain silo capacity (from 1.5 million tonnes in 2014 to 3 million tonnes in 2019). This favourable supply environment is supported by several government measures taken to enhance food availability in the country for at least several months:

- The Government imported significant quantities of basic staples including wheat, yellow corn, soybeans and legumes.
- Egypt's cultivated wheat area this season exceeded 3.4 million feddan (1.38 million ha), and production is expected to be at least 9 million tonnes, which is the same level as last year and the five-year average. Winter crops currently being harvested include barley, fava beans, alfalfa, potatoes, onions and other vegetables. Sugar factories currently receive beet from farmers that will increase domestic sugar supplies.
- The Central Bank of Egypt (CBE) has expanded its EGP 100 billion industry stimulus initiative to include SMEs in fish, poultry and livestock companies.
- About 29,000 families of community school students and teachers received unconditional cash transfers in 9 governorates (Assiut, Aswan, Luxor, Giza, Fayoum, Matrouh, Qena, Bani Suweif and Minia) redeemable for nutritious food items at local retail shops.

Sources: FAO (2020); WFP (2020b)

As a result of such mitigating measures as well as enhancing production of strategic crops and the embarking on adoption of import pricing smoothing measures like increasing the utilization of options (in a number of MENA countries including Egypt, Algeria, Saudi Arabia, Tunisia, and Jordan) (FAO, 2020), the impact of COVID-19 on FS has been largely contained. As previously mentioned, 2007/2008 crisis has triggered many of such reforms in MENA countries where several measures targeting mainly availability of supplies and preventing price vulnerability have been adopted (FAO, 2020). In general, MENA countries have changed their policies over time to respond and adapt to the fluctuations in the food world market. In most MENA countries, on the institutional level, the storage and trading of strategic commodities are undertaken by the state or semi-state entity (e.g. Tunisia, Egypt, and the GCC countries).

In addition, trading policies have developed over time to ensure better diversification of main sourcing countries for import contracts, and overcome price risk and vulnerability by adoption of options (FAO, 2020). Yet, the panic of securing stocks for a region considered the largest importer of wheat worldwide and a relatively large importer of rice led to a slight increase in global wheat price and a relatively larger increase in world rice price (Fan et. al, 2020). Focusing on specific cases associated with COVID-19 crisis, a number of MENA countries have opted for additional policies. For example, the Lebanese government adopted a special arrangement allowing traders to use pegged exchange rates when purchasing grains from the world market, as a mean to buffer the domestic market from the impact of the COVID-19 crisis and the financial problems Lebanon has been passing by (FAO, 2020).

Resorting to intensifying the usage of digitalization within food supply systems is another type of response to the crisis that is not efficiently utilized till today in the region. Digitalization has proved to shield many sectors or even aid them to thrive during the crisis. COVID has created a good opportunity to exploit such a method that would contribute to establishing resilient and sustainable food systems. For example, the utilization of technology in disseminating technical information to farmers as a mean of outreaching a large number in remote areas while providing a regular follow up can have significant positive impact on productivity. To the knowledge of the author, only some first steps for such orientation exist in Egypt where several initiatives for developing software applications for farmers are in progress (IFPRI, 2020b).

The problem with the measures adopted by MENA countries is that they relaxed the availability constraint, despite the fact that it has not been the main concern whether on the global level (as depicted in *Section One*) or on the regional level as explained above. Measures to tackle the accessibility pillar have been general and not food focused when it comes to raising the affordability of the population (e.g. social safety net measures). As identified by UNSDG (2020) the people who were already exposed to nutrition and dietary deprivations before COVID-19 crisis remained the ones most vulnerable after the crisis. Measures tackling the utilization pillar remained rather absent.

### **Section Three: Empirical Assessment of the Relationship between the Pandemic and Food Security**

Anecdotal evidence addressing the impact of the pandemic on FS has been quite extensive yet empirical studies based on primary or secondary data has been relatively limited due to the recency of the issue and the bundle of uncertainties carried within. Studies varied from those depending on field surveys building upon face to face and/or long distance interviews with households (Amare et. al, 2020; Elshoryi et. al, 2020) and those using secondary data whether on country (Erokhin and Gao, 2020) or household levels (Amare et. al, 2020). Some studies followed robust econometric analysis (Erokhin and Gao, 2020; Elshoryi et. al, 2020; Amare et. al, 2020), while some followed scenario based exploratory approach (Umdale et. al, 2020) and others diverted to simple logical descriptive analysis (Mouloudj et. al, 2020). Moreover, a set of IFPRI and World Bank studies employed a SAM multiplier and CGE models (Raouf et. al, 2020; ElKadhi et. al, 2020; Breisinger et. al, 2020, World Bank Group, 2020) to assess the economy wide impacts of the crisis.

This section addresses the nature of the link between the pandemic and FS through understanding the inter-country variability by applying simple cross sectional econometric analysis. In a trial to understand this relationship within the constraint of data limitations due to the novelty of the issue, two approaches were followed. The first tries to understand the link between various country specific capacities in handling the pandemic on one side and its FS level on the other. The second relates the severity of the disease itself and the FI situation in each country. In the two approaches, the MENA situation is compared to the rest of the world.

### *First Approach:*

The first approach aims at understanding the link between COVID country preparedness (rather than the intensity of COVID occurrence per se as in the majority of the reviewed studies) and FS levels in various countries. The composite global FS index (GFSI<sup>14</sup>) is taken as a proxy for FI. The lower its score, the higher is the status of FI. The index covers a set of developing and developed economies amounting to 113 countries. The value of the index scores in 2019 represents the dependent variable that the model seeks to understand the significance of the variables that explain the inter-country variability of which. The index covers all MENA countries except for Iran, Djibouti, Palestine, Iraq, Libya, Lebanon and Malta.

To measure the effect of the countries' variability regarding their degree of readiness for handling and dealing with the disease, the composite INFORM COVID risk index, published by the European Commission, is used. It is an adapted version of the epidemic risk index which provides scores for countries according to the degree of risk arising from a taxonomy of indicators capturing demographic, economic, socio-economic, and institutional rigidities like, among others; the level of awareness, population density, proportion of population at increased risk of severe COVID disease, economic vulnerability, and access to health care as well as governance. These types of rigidities are lumped into three sub-indices, namely the hazard and exposure, vulnerability, and lack of coping capacity indices. The index covers such sources of strains that existed before the pandemic outbreak in each country and that could highly limit effective national response to the crisis resulting in health and humanitarian hazards. The lower the score the better the country in each of the three dimensions in handling the pandemic (Poljanšek et al., 2020).

Since the vulnerability sub index includes FI within its measurements, it was excluded from the analysis to avoid potential endogeneity problems. The analysis thus includes the other two sub-indices, namely; hazard and exposure and lack of coping capacity.

Yemen, Djibouti, Libya, Syria, Palestine, and Lebanon had the highest risk scores<sup>15</sup> within the MENA region for COVID coping capacities reflecting the institutional (governance and corruption) as well as health related infrastructure deficiencies (Figure 12)<sup>16</sup>. Bahrain, Yemen, Djibouti, Palestine, Oman and Qatar had the worst scores compared to other MENA countries in COVID hazard and exposure index which covers demographic aspects as well as sanitation and hygiene (Figure 13)<sup>17</sup>. It is worth noting that Lebanon, Yemen, Palestine and Djibouti have been classified as having "high" COVID risk regarding preparedness (grasping the 3 dimensions), whereas "Low" degree of risk characterized high

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<sup>14</sup> This is a comprehensive FS index that has been published by Economic intelligence Unit since 2012, which is a country-level food-security measurement tool that addresses the issues of affordability, availability and utilization (quality and safety) in 113 developed and developing countries.

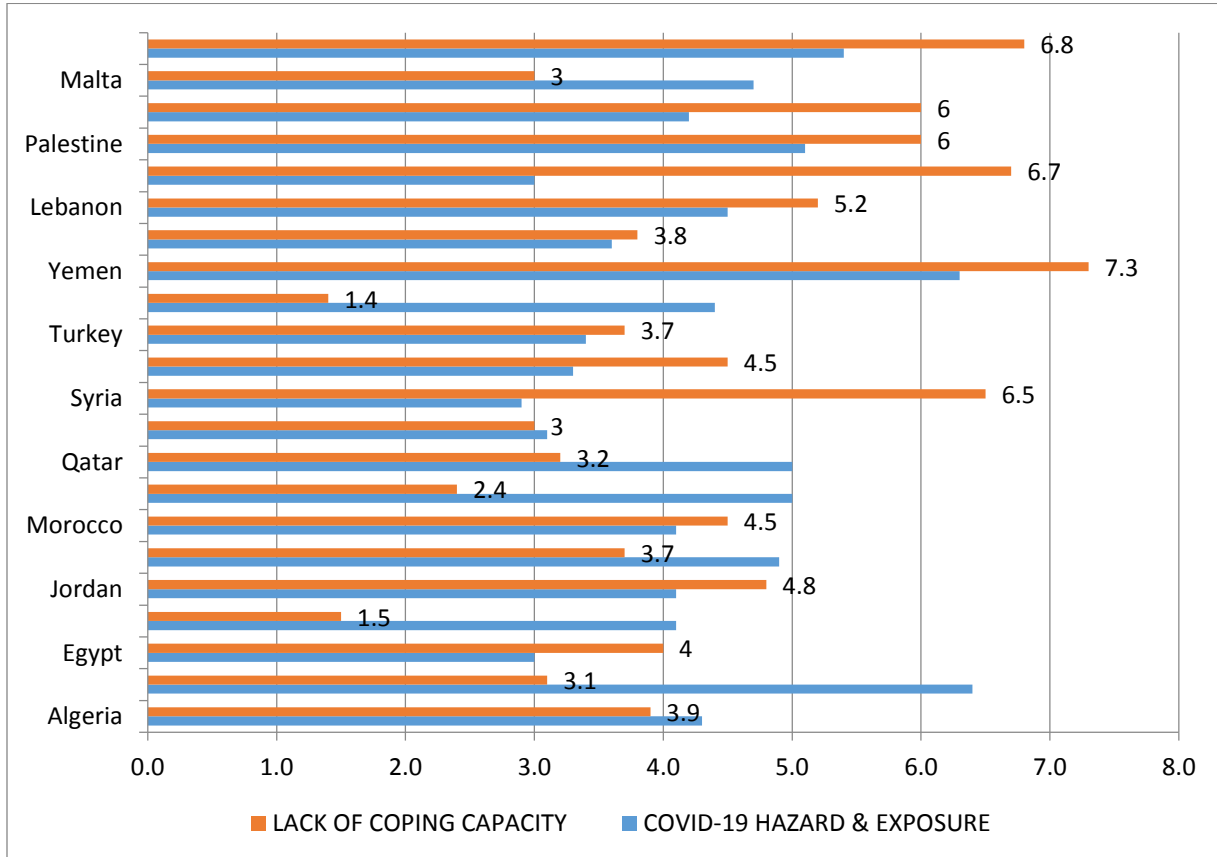
<sup>15</sup> High scores were assumed the ones exceeding 5 out of 10, 10 is the highest and thus the most risky.

<sup>16</sup> This index includes health system capacity specific to COVID-19, government effectiveness, corruption perception index, immunization coverage, health system capacity, per capita public and private expenditure on health care, and maternal mortality ratio.

<sup>17</sup> This index includes population density, urban population growth, population living in slums and household size in addition to availability of drinking water, sanitation and hygiene (Poljanšek et al., 2020).

income countries in the region (Qatar, Saudi Arabia, UAE, Oman, and Israel) and all the rest lied in the “medium” range (Poljanšek et al, 2020).

**Figure 13: COVID Hazard and Exposure and Lack of Coping Capacity Risk Indices in MENA countries**



Source: Poljanšek et al. (2020)

To incorporate the effect of country variability within the various pillars of FS, the estimated equation includes two measures for food affordability and two measures to control for each of the accessibility and availability pillars. The ratio of food imports to total exports was included to reflect the affordability dimension. This variable illustrates a country’s ability to purchase food from international markets using its export revenues, while also taking into account food availability and food accessibility on the international market (Breisinger et al, 2012). Food inflation rates were used to gauge for the accessibility dimension. GDP per capita was used to encompass a wider measure for the affordability dimension whereas the average dietary energy supply adequacy was included as a proxy to reflect food availability.

The data set for this model includes all countries simultaneously covered by the EIU (2020) GFSI and the INFORM COVID index amounting to 112 countries. The regression equation includes two dummy interactive terms for examining the significance of the effect if the country belongs to the MENA region along with their corresponding level of COVID readiness regarding exposure and lack of coping capacity risk measures. This would help to comprehend the relative impact of the variations in those

two indices on the variability in FS levels in the region compared to rest of the world. Values for all variables are taken for the year 2019 which is the latest year available and is suitable to use with the scores of the two sub-indices of the INFORM COVID risk index as the latter reflect the country specific demographic and institutional rigidities initially prevailing before the occurrence of the pandemic. Equation (1) takes the following form:

$$GFSI_i = \alpha_i + \beta_1 * HAZ_i + \beta_2 * COP_i + \beta_3 * GDPC_i + \beta_4 * DES_i + \beta_5 * FDINF_i + \beta_6 * RFDIMP_i + \beta_7(MENA_i * HAZ_i) + \beta_8(MENA_i * COP_i).....(1)$$

**Table 2: Definition of Variables in Equation (1) and their Data Sources**

Variable	Definition	Data Source
GFSI (dependent variable)	Global FS Index	EIU (2020) <sup>18</sup>
GDPC	GDP per capita at constant prices (=2015)	UNCTADSTAT (2020) <sup>19</sup>
HAZ	COVID-19 Hazard and Exposure Index	Poljanšek et al. (2020) <sup>20</sup>
COP	Lack of coping capacity	Poljanšek et al. (2020)
DES	Average dietary energy supply adequacy (percent) (3-year average)	FAOSTAT(2020a) <sup>21</sup>
FDINF	Food inflation	FAOSTAT(2020a) <sup>22</sup>
RFDIMP	Ratio of food imports to total exports	Calculated from UNCTADSTAT (2020)
MENAHAZ	Dummy variable that takes a value of 1 if the country belongs to the MENA region and 0 otherwise along with its score in the hazard and exposure index	
MENACOP	Dummy variable that takes a value of 1 if the country belongs to the MENA region and 0 otherwise along with its score in lack of the coping capacity index	

<sup>18</sup> <https://foodsecurityindex.eiu.com/>

<sup>19</sup> [https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS\\_referer=&sCS\\_ChosenLang=en](https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS_referer=&sCS_ChosenLang=en)

<sup>20</sup> <https://drmhc.jrc.ec.europa.eu/inform-index/INFORM-Covid-19>

<sup>21</sup> <http://www.fao.org/faostat/en/#data/FS>

<sup>22</sup> <http://www.fao.org/faostat/en/#data>

*Results:* A two stage least squares was used to overcome endogeneity problems<sup>23</sup>. Results showed that both coefficients of COVID related risk indices had highly significant estimates with negative signs revealing that the higher the country is at risk of having weak demographic, health related and institutional factors in coping with the pandemic, the lower the score it gets for FS. This implies that the various existing structural rigidities in various countries that could limit their ability to handle the pandemic are negatively related to their FS level. As Table 3 shows, the coefficient of the lack of coping capacity in confronting the pandemic had a higher magnitude compared to that of hazard and exposure. Looking at the details of the measures upon which each sub-index is built, institutional aspects like weak governance and high corruption, as well as health related infrastructural deficiencies that limit the ability to cope with the pandemic, are all related to higher levels of FI with a higher degree compared to demographic variables like population density, urban population growth or population living in slums. This adds up more complexity to the transmission mechanisms, previously discussed in *Section Two*, being not only limited to supply and demand pathways.

The significant coefficients for food inflation and GDP per capita (as measures for accessibility and affordability) as well as the food availability proxy and their corresponding signs (Table 3) are in line with the theoretical and conceptual framework previously discussed. Coefficients of the MENA dummy interactive terms showed significant estimates for both indices with much worse results regarding the lack of coping capacities associated with lower levels of FS compared to the rest of the world. This puts the region at a disadvantaged situation regarding its coping capacity limitations as represented by the weak governance, corruption and fragile health systems compared to the rest of the world. The coefficient concerning the exposure and hazard index showed a counterintuitive positive link with FS, though with a negligible magnitude. Though it is difficult to interpret such result, the negligible effect implies highly weak relationship.

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<sup>23</sup> Instruments were tested and results rejected the null hypothesis of having weak instruments. Also the model was tested for over-identification (using Sargan and Bassman tests) and the p values led to not to reject the null hypothesis of having a valid set of instruments and that the model is correctly specified.



**Table 3: Results of Regression Estimation (1), FS and COVID Risk Exposure and Lack of Coping Capacities**

Variables	Definition	Estimates
GDPC	GDP per capita at constant prices (=2015)	.0001161** (0.003)
HAZ	COVID-19 Hazard and Exposure Index	-2.524814*** (0.000)
COP	Lack of coping capacity	-2.869009*** (0.000)
DES	Average dietary energy supply adequacy (percent) (3-year average) OR Average value of food production (constant 2004-2006 I\$/cap) (3-year average)	.0854127 *** (0.000)
FDINF	Food inflation	-.3145633*** (0.000)
RFDIMP	Ratio of food imports to total exports	1.240247 (0.629)
MENAHAZ	Dummy variable that takes a value of 1 if the country belongs to the MENA region and 0 otherwise along with the hazard and exposure index	2.973736*** (0.000)
MENACOP	Dummy variable that takes a value of 1 if the country belongs to the MENA region and 0 otherwise along with the lack of coping capacity index	-3.369261*** (0.000)

\*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1

*Second Approach:*

The second approach aims at investigating the link between the intensity of the pandemic per se after its outbreak in 2020 and FI through cross-sectional analysis. In line with a number of studies, the severity of the pandemic is measured in terms of the number of confirmed cases in each country (Adame et al., 2020, Erokhin and Gao, 2020). While there is no agreement in the literature regarding the suitable measure for FI, the study adopted the same definition applied by Erokhin and Gao (2020) where they expressed it by the number of people with poor or borderline food consumption as it was the only indicator reflecting FI amid the pandemic on a country level<sup>24</sup>.

Data concerning both measures were collected from the World Hunger Map<sup>25</sup>, published by the WFP, as per the latest figures by the end of January 2021. The map registers the values of those variables, among others, on daily basis covering 93 developing economies that experience food consumption insufficiency. This infers that it does not cover the high income economies in the MENA region which includes GCC countries as well as Israel.

$$FI_i = \alpha_i + \beta_1 * COVNUM_i + \beta_2 * GDPC_i + \beta_3 * DES_i + \beta_4 * FDINF_i + \beta_5 * RFDIMP_i + \beta_6(MENA_i * COVNUM_i).....(2)$$

**Table 4: Definition of the New Variables in Equation (2) and their Data Sources**

Variable	Definition	Data Source
FI (dependent variable)	FI as measured by the number of people with insufficient food consumption per million in each country	World Hunger Map
COVNUM	COVID number of confirmed cases in each country	World Hunger Map

*Results:* Applying Ordinary Least Squares (OLS) on this cross sectional data showed that the intensity of the pandemic had a significant positive coefficient which reveals that countries experiencing high numbers of confirmed COVID cases are also having high numbers of people with poor or borderline consumption, Table 5. This is in line with the arguments raised in *Section Two* and all expectations of international organizations where the harsher the intensity of the disease, the higher the probability

<sup>24</sup> This measure is defined as “People with insufficient food consumption refer to those with poor or borderline food consumption, according to the Food Consumption Score”; “Poor food consumption: Typically refers to households that are not consuming staples and vegetables every day and never or very seldom consume protein-rich food such as meat and dairy. Borderline food consumption: Typically refers to households that are consuming staples and vegetables every day, accompanied by oil and pulses a few times a week.” (<https://hungermap.wfp.org/>).

<sup>25</sup> <https://hungermap.wfp.org/>

the country would fall in a FI status. Though the data sets are different where here it is only limited to developing countries while that used in equation (1) was with a wider scope covering a more non-homogenous set of countries, yet comparing the two COVID related impacts revealed that the degree of link between FI on one side and the demographic, institutional and health related deficiencies, on the other, exceeded by far that of the intensity of the disease per se.

As Table 5 reveals, GDP per capita at constant prices has a negative significant coefficient estimate emphasizing the same direction of linkage with FS in equation (1), where the higher the GDP the less the FI level the country suffers from, since higher GDP per capita implies not only affordability but also better diet and nutrition aspects. Note that the magnitude of the coefficient is much higher than that in equation (1) denoting the importance of GDP per capita in explaining the inter-country differences in FS levels within the set of developing countries suffering from relatively high level of FI. Unlike the results reached by Erokhin and Gao (2020), food inflation reflecting accessibility dimension is insignificant, which can be explained by the usage of one year cross sectional data in our case where price fluctuations are smoothed whereas Erokhin and Gao (2020) applied monthly data. However, they still reached some counterintuitive results (positive relationship) regarding the link between inflation and FI which they explained by governments' intrusion in many developing countries in setting food prices (Erokhin and Gao, 2020). The ratio of food imports to total exports variable remained insignificant as in the first equation estimation. Like the first approach, the MENA interactive coefficient is significant yet weakly (P value less than 0.1). Having a negative value with a lower magnitude than that of the number of confirmed COVID cases, reflects still a positive relation with FI in the MENA region (the higher the number of cases, the higher the degree of FI), yet with a slightly lower magnitude compared to the rest of the world, Table 5. This implies that the COVID-19 intensity affects the FI in MENA in negative terms when using number of people with insufficient food consumption as an indicator yet with a degree less than other developing countries covered by the dataset. Although the study did not follow income country classification as Erokhin and Gao (2020) did, this result does not contradict theirs where they found FI in some MENA countries weakly (Turkey) or even negatively linked to the number of COVID cases (Yemen, Iran, Jordan, and Libya). They found weaker link for low income countries in general (Erokhin and Gao, 2020). Moreover, the weaker link between number of COVID cases and number of people suffering from insufficient food consumption for MENA might be in contrast to intuitive expectations that many countries within the region suffer relatively more from the modest accessibility and utilization pillars of their FS systems. Yet, when taking into account that the data does not include developed countries, the interpretation is clear where MENA countries (excluding high income countries) is in a relatively better position when compared to other countries included in the set which mainly includes Sub Saharan and Latin American countries.

**Table 5: Results of Regression Estimation (2), FI and COVID Intensity (Confirmed Cases)**

Variables	Estimates	
COVID Intensity (confirmed cases)	.000022*** (0.000)	Number of observations = 84 F( 6, 77) = 52.69 Prob > F = 0.0000 R-squared = 0.8041 Adj R-squared = 0.7889 Mean VIF   1.24 Breusch-Pagan / Cook-Weisberg test for heteroskedasticity Ho: Constant variance F(1 , 82) = 0.30 Prob > F = 0.5859
GDP per capita at constant prices (=2015)	-.0026219** (0.005)	
Average dietary energy supply adequacy (percent) (3-year average)	.0108127 (0.906)	
Food inflation	-.0033838 (0.802)	
Ratio of food imports to total exports	-8.341193 (0.305)	
MENA COVID Intensity (confirmed cases)	-.0000118** (0.042)	

\*\*\*p < 0.01, \*\*p < 0.05, \*p < 0.1

*Limitations:*

In evaluating the study results, several limitations need to be taken into account. First, the cross-sectional nature of the study does not allow for causality to be inferred, nor was it feasible to assess changes over time which was highly restricted by data insufficiency due to the novelty of the topic. Second, classifying countries according to their income level would have enriched the analysis, yet again this was restricted by data availability and would have resulted in lowering the number of observations. Third, estimations should not be taken as precise estimates in magnitude being based on cross sectional data that ignores time dimension. Fourth, the World Hunger Map data, upon which the second equation is based, covered only those countries already experiencing high prevalence of undernourishment which makes the analysis more restricted. Finally, the analysis treated MENA countries as one entity, though, as previously discussed, impact of the pandemic on FS has very country specific effects within the region that should be accounted for, an area needed for further research.

#### **Section Four: Conclusion and Policy Implications**

The study has shown that COVID-19 crisis when observed as a food crisis is significantly different from the food crisis in 2007/2008. Apart from the severity, the scope, the vagueness of its progress, time plays a pivotal role in the assessment of its repercussions. During the course of writing this paper, information has changed and expanded on daily basis bringing up many challenges to encompass the various dimensions of the crisis. More importantly, this draws attention to the significance of timely proactive solutions and responses to contain the divergent consequences of the crisis.

MENA countries are facing the COVID-pandemic with an already alarming FI situation that has been deeply rooted in a number of countries within the region. This deprives many countries from having full power to buffer the transmission of a multitude of adverse effects of the crisis on all FS pillars. COVID has mainly affected the affordability and utilization pillars of FS, and almost had negligible effects on the availability pillar, at least in the interim. In this regard, the credit goes partially to the food crisis in 2007/08 which triggered the increase in staples storage in most of the countries as a strategy that shielded many from a good fraction of the negative impacts of COVID on FS. A considerable portion of challenges facing MENA countries lies in the measures adopted to respond to the crisis where governments all over the world as well as in MENA region have reacted, so far, in a general and traditional manner. Their interventions have mainly focused on relaxing the least problematic constraint, availability, and left aside tackling the accessibility and utilization pillars. Depending on reserves and stocks, while it was a major savior for many countries, is not a sustainable policy. With the unforeseen duration of the crisis and its drastic recessionary impacts that are getting gloomier on daily basis, the availability pillar would be also hurt and countries should be ready for that scenario.

Wrongfully putting food sufficiency rather than FS as a main goal, trade restrictions came as a first resort to a number of countries just as they did as a panic reaction during the crisis in 2007/08, though with a much lesser degree. A number of countries has imposed export restrictions or even bans on a list of food items and some has relaxed imports' restrictions but both served the availability pillar. Resorting to such trade restrictions, although proved that it injures more than cures throughout the experience in the 2007/08 food crisis, might only offer a very transitory solution.

MENA is not a homogenous entity, the degree of exposure to food-related COVID risks differ considerably across countries in the region. GCC countries face a relative minimum degree of risk where the countries secured their food supply through ensuring enormous reserves, facilitating imports by giving up restrictive import requirements and minimizing the risk by diversifying providers. Moreover, their relatively limited agricultural production and low agricultural exports lowered the probability of being subjected to COVID-19-associated supply risks to domestic production. Further, their edge lies in having modernized well established capital intensive value chains that significantly helped in mitigating the crisis impact. Realizing this fact, they responded by intensifying such chains and their international linkages. Although they have very strong affordability pillar, they still need to address a descending utilization pillar having one of the highest diabetes and obesity worldwide with no sign of improvement. Having the majority of the population, in some GCC countries, as migrant

workers, “the invisible martyrs of the food system”<sup>26</sup>, suffering from variable degrees of social and legal discrimination is another major jeopardy. In many cases they are not covered by social security schemes in addition to enduring restricted labor rights. All such factors need extreme scrutiny and reform in order to empower the ability of a considerable segment of the population in general and in the face of the current crisis in particular. Other countries in the region face a higher degree of risk due to the relatively high rates of food import dependency as well as the high food expenditure shares which makes them more prone to shocks on the demand side. This includes Egypt, Algeria, Yemen, Iraq, Jordan and Palestine. From this perspective, the risk is a bit minimized for Morocco and Tunisia having relatively lower food import dependency. Other factors like conflict in Syria and Yemen, financial crises and political unrest in Lebanon and instability in Iraq magnify the risk. Institutional factors like corruption, deficient and weak demographic aspects, absence of efficient social security systems in many cases undermine the ability of governments in providing the needed protection from the consequences of COVID-19 especially for the most vulnerable, marginalized and poor strata.

MENA countries should make use of this crisis to tackle the structural imbalances affecting accessibility and utilization pillars of FS. Woertz (2020) and other scholars identified that COVID has brought the time for MENA countries in general and GCC countries in specific to shift their major focus from food availability to food accessibility and utilization. The former efforts in MENA countries have left those two dimensions of FS lagging behind. Measures to tackle the affordability and accessibility pillars have been general and not food focused. In this respect, the enhancement of social safety nets as a measure undertaken by all governments might have positive spillover effects on the accessibility pillar, but it remained short on targeting FS per se. Such enhancement should not include civil society charity initiatives as a main resort, if the aim is to at least maintain the level of FI. This channel will soon dry up if the pessimistic expectations of expanding economic downturn came into effect. Among the policy recommendations that can be implemented in this respect is nudging their population towards a healthy diet and nutrition prescriptions. Hence, the enhancement efforts of social safety nets should be tilted to focus on healthy food either by specific coupons or by enhancing the awareness (given the fact that it is the right time) about the importance of consuming healthy food to face the health crisis. Moreover, MENA countries should devote extra efforts to fix their local supply chains and enhance their integration in global value chains when it comes to food products and inputs, while developing the accompanying risk management systems and overcoming logistical problems and anti-competitive behavior (FAO CFS HLPE, 2020; Mouloudj et. al, 2020).

As identified by UNSDG (2020) the people who were already exposed to nutrition and dietary deprivations before COVID-19 crisis remained the ones most vulnerable after the crisis. Perhaps the general impact of the crisis and dealing with it as a health and economic crisis has left FS at the back seat. This is an issue that needs to be prudently addressed by MENA governments to avoid its potential negative consequences. Anecdotal evidence (e.g. Woertz, 2020; Ghoneim 2015; Mouloudj, 2020) for a large number of Arab countries indicates that MENA countries suffer from inefficiency in the domestic food markets, arising from anti-competitive behavior and fragmented supply chains. The measures undertaken by governments in MENA to contain COVID-19 effects did not focus on

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<sup>26</sup> Zurayk (2020)

reforming such issues. COVID has brought the urgency to pursue radical reforms and revisit many directly and indirectly related structural and institutional long rooted rigidities across the region.

In order to understand the link between FI and the pandemic, the study employed two types of datasets and correspondingly two equations were estimated using two different FS indicators and two indicators to proxy the effect of the pandemic. The empirical assessment showed that COVID, whether expressed by its intensity, number of confirmed cases, or by the degree of country preparedness to handle the disease, is significantly linked the country variations regarding their FS levels. The higher the number of confirmed cases and the weaker the degree of country preparedness, the higher is the level of country FI level. However, as Zurayk (2020) constructively articulated, COVID is to a great extent innocent from the charges thrown on it of being the exclusive cause of many of the adverse impacts on FS. The pandemic has been rather the magnifying loop that made the inadequacy, caveats and fragility of the food systems worldwide and in MENA countries in specific clear and more tangible. Along the same lines, the empirical assessment in the study showed that as much as FI variability across all countries is explained by the variability of the intensity of the disease per se, it has drawn vivid attention to the importance of the efficient institutional and demographic prerequisites needed to handle the disease in this respect. More precisely it revealed that the higher the country is at risk of having weak demographic, health related and institutional factors in coping with the pandemic, the lower the score it gets for FS. Institutional aspects like weak governance and high corruption, as well as health related infrastructural deficiencies that limit the ability to cope with the pandemic, came in the first place in explaining country variability for having higher levels of FI. Demographic variables like population density, urban population growth or population living in slums came in the second place. Regression results has also put the MENA region at a disadvantaged situation, compared to rest of the world, regarding its coping capacity limitations as represented by the weak governance, corruption and fragile health systems in explaining the country variability in FS levels. So again it is not the pandemic per se, but rather the structural, demographic, economic and institutional deficiencies that attention should be devoted to in order to have a more sound level of FS, even if COVID did not exist.

The importance of the affordability pillar was also illustrated in the empirical part of the study where GDP per capita as a measure of affordability in both models has proved to significantly explain country variability regarding FS levels. The significant coefficients for food inflation as well as the food availability proxy and their corresponding signs within the broader set of countries, encompassing developing as well as developed, are in line with the theoretical and conceptual framework showing their importance in understanding country FS variability. However, both pillars were insignificant in explaining the FS variability across developing countries already suffering from poor or borderline levels of insufficient food consumption. Within the latter set of countries, MENA was also negatively related to the intensity of the disease (number of confirmed cases) yet with the lower degree compared to Sub Saharan and Latin American countries covered by the dataset. This is in line with results of other studies like Erokhin and Gao (2020) where they found FI in some MENA countries is weakly (Turkey) or even negatively linked to the number of COVID cases (Yemen, Iran, Jordan, and Libya).

Preferential trade agreements signed by MENA countries need to address FS. So far the existing trade agreements signed by MENA countries among themselves (e.g. PAFTA, Agadir) or with their major trading partners (as EU Association Agreements) have suffered from protectionist attitude when it comes to agriculture (World Bank, 2020). A remaking of such agreements needs to be considered targeting FS and addressing lessening the protectionist attitude and engagement in secure and safe value chains.

A side but important point, is the data availability and transparency. In order to hold a better understanding of the repercussions of the pandemic and thus offer rigorous analysis and constructive policy implications, more data transparency is needed. Within the region a number of countries stopped declaring COVID testing data and fatality rates. For example, as World Bank (2021) noted, Algeria stopped reporting such figures when its positive rates reached extreme limits, while Syria did not report testing data at all (World Bank, 2021). In this respect the GCC countries are the best performers. This alone indicates that MENA faces a transparency challenge. Transparent dissemination of information in general regarding testing, number of confirmed COVID cases, food prices, food situation, will strengthen government management over the food market during such abnormal circumstances and lessen the degree of panic that usually results in unfavorable outcomes.

From another angle, COVID-19 has shifted the whole world to a new norm where digitalization became at the core of everything. FS still lags behind in this regard. Except for some early signals in Egypt, agriculture is not monitored by any digital application in the majority of MENA. Introducing information technology based applications in farming for example whether in terms of enhancing awareness of small scale farmers or for collecting and analyzing data is among the reforms that should be seriously considered in the region. The effects of such orientation are highly expected to be translated into improved productivity as well as intensified supply chains and better logistics. The use of information technology have opened a new set of business in the food industry through the use of applications for food order and delivery that could potentially and partially offset the job losses due to the lock downs and confinement. In addition, COVID has brought a positive side with the improvement of many aspects of food safety, including delivery and dining behavior, provided that this would prevail after the crisis. The hope thus lies in the pandemic itself to trigger the long lasting neglected reforms within food systems and across the indirectly related channels in the same manner by which 2007/08 food crisis unintentionally cushioned major repercussions of COVID today.



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**Annex:**

**Table 1: GFSI Scores in MENA Countries in 2019**

Overall			Affordability			Availability			Quality and Safety		
	Score / 100	Δ		Score / 100	Δ		Score / 100	Δ		Score / 100	Δ
Qatar (13)*	81.2	+2.9	Qatar	98.9	0.0	Israel	73.6	+1.2	Qatar	84.1	-0.1
Israel (18)	79.0	+0.5	UAE	89.8	+0.2	Egypt	70.2	+0.3	Israel	83.8	-0.1
UAE (21)	76.5	+1.0	Kuwait	88.1	-0.2	Turkey	64.8	-1.5	UAE	78.5	+4.4
Kuwait (27)	74.8	+3.2	Saudi Arabia	86.3	-0.1	Morocco	64.2	+0.7	Kuwait	75.9	0.0
Saudi Arabia (30)	73.5	-0.2	Israel	83.0	0.0	Qatar	64.0	+6.6	Oman	74.4	+0.1
Turkey (41)	69.8	-0.6	Bahrain	81.9	-0.4	UAE	63.7	+0.5	Saudi Arabia	73.5	+0.1
Oman (46)	68.4	+0.5	Oman	77.8	+0.1	Kuwait	62.3	+7.4	Turkey	71.1	0.0
Bahrain (50)	66.6	+1.5	Turkey	74.7	+0.1	Saudi Arabia	61.8	-0.4	Egypt	65.9	0.0
Egypt (55)	64.5	0.0	Jordan	70.5	-0.1	Tunisia	58.0	-3.7	Tunisia	62.2	+0.3
Morocco (59)	62.8	+0.8	Algeria	66.9	+0.1	Oman	57.6	+0.8	Morocco	61.9	+0.5
Jordan (64)	61.0	+0.8	Morocco	61.5	+0.9	Bahrain	56.3	+3.7	Bahrain	56.9	+0.3
Tunisia (69)	60.1	-1.3	Tunisia	61.5	+0.6	Algeria	55.8	-0.3	Jordan	54.2	0.0
Algeria (70)	59.8	-0.8	Egypt	57.6	-0.4	Jordan	54.8	+2.0	Algeria	53.0	-4.6
Syria (107)	38.4	+1.3	Yemen	45.5	0.0	Syria	38.9	+2.8	Syria	46.4	0.0
Yemen (111)	35.6	-0.7	Syria	34.6	+0.1	Yemen	28.6	-1.2	Yemen	30.2	-0.9

\*the parentheses denote the world rank in 2019 across 113 countries covered by the index. Source: EIU (2020); <https://foodsecurityindex.eiu.com/>



**Table 2: MENA Countries Grouped by GDP per Capita, Political Stability, Food Insecurity and COVID Intensity**

		GDP per Capita (constant 2015) 2019	Political stability and absence of violence/terrorism (index) 2018	Global Hunger Index (2020)	Food Insecurity (2018/2019)		COVID cases	
					PoMSFI (%)	PoU (%)	Number of confirmed cases (till January 2021)	death/cases %
Low Income	Yemen	716.9098	-3				2,118	29.0
	Syria	1194.212	-2.74				13,557	6.5
Lower Middle Income	Algeria	4119.43	-0.79	9	17.6	2.8	105,369	2.7
	Djibouti	3183.33	-0.13				5,918	1
	Egypt	3837.485	-1.16	11.9	34.2 (+)	4.7	161,143	5.5
	Morocco	3224.816	-0.33	8.9		4.3	465,769	1.7
	Tunisia	3938.674	-0.9	5.7	20 (+)	2.5	195,314	3.2
	Palestine	3182.421	-1.74				155,006	1.2
Upper Middle Income	Iran	4887.369	-1.31	7.9	39.7	4.7	136,7032	4.2
	Iraq	4748.228	-2.56	17.1		23.7	612,870	2.1
	Jordan	4064.575	-0.38	8.8			319,519	1.3
	Lebanon	7174.747	-1.64	8.9		5.7	276,587	0.8
	Libya	4630.108	-2.44		35.9 (+)		112,540	1.5
	Turkey	11853.45	-1.33	<5		2.5	242,328	10.3

**Table 2: MENA Countries Grouped by GDP per Capita, Political Stability, Food Insecurity and COVID Intensity (continued)**

		GDP per Capita (constant 2015) 2019	Political stability and absence of violence/terrorism (index) 2018	Global Hunger Index (2020)	Food Insecurity (2018/2019)		COVID cases	
					PoMSFI (%)	PoU (%)	Number of confirmed cases (till January 2021)	death/cases %
High Income	Bahrain	21177.83	-0.84				107,329	
	Israel	40580.39	-0.93		12.2	2.5	685,583	0.74
	Kuwait	27623.48	0.11	<5	12.3	2.5	170,036	0.56
	Oman	13844.36	0.65	12.2		7.8	135,041	1.13
	Qatar	60013.32	0.68				153,690	0.16
	Saudi Arabia	19753.31	-0.52	7.5		4.8	369,961	1.72
	UAE	39042.16	0.74			3.1	323,402	0.28

Sources: <https://unctadstat.unctad.org/wds/>, FAO et al. (2020), FAOSTAT (2020a), WFP (2021), WDI (2020)

<https://databank.worldbank.org/source/world-development-indicators>,

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**Table 3: Percentage Changes in Poverty Rates Due to COVID Crisis GDP Losses**

	Poverty rate (\$3.2 in 2011 PPP) (2021)	
Algeria	26.4	42.12
Egypt	15.8	12.43
Iran	20.79	17.12
Iraq	49.17	46.58
Jordan	19.14	27.02
Lebanon	100.98	–
Morocco	28.38	27.31
Tunisia	30.3	37.63

Projections in the first column are based on a common elasticity for the eight MENA countries at each poverty threshold while the second column uses varying poverty-to-GDP elasticities across countries as well as across poverty thresholds (World Bank, 2021). Source: World Bank (2021)

**Table 4: Vulnerability of MENA countries to Food-Related COVID-Induced Disruptions**

	Supply Related Shocks	Demand Related Shocks
Kuwait (intermediate low risk)*, UAE (Low risk), Saudi Arabia (intermediate low risk) Oman (intermediate low risk), Qatar (Low risk), Bahrain (Low)	With relatively limited domestic agricultural production and limited agricultural exports, GCC countries have limited and low to intermediate low exposure to COVID-19-associated supply risks to domestic production. GCC countries shield their food supply through reserves and trade, at least in the interim. Their edge lies in the modernized well established value chains that helped in mitigating the crisis impact to a great extent	With high food import dependency but low share of food expenditure in total expenditures, GCC countries are exposed to relatively low to intermediate low risk of exposure to demand risks. The relatively high per capita income of these countries may shield the population from potential demand shocks. Food subsidies are also an important 'automatic stabilizer'. Still migrant workers are under extreme risk being not covered with social security schemes and face severe kind of social and legal discrimination.

**Table 4: Vulnerability of MENA countries to Food-Related COVID-Induced Disruptions (continued)**

	<b>Supply Related Shocks</b>	<b>Demand Related Shocks</b>
Tunisia (intermediate low risk), Algeria (High Risk), Libya, Morocco (intermediate low risk)	The degree of exposure to supply risks varies considerably among the Maghreb countries. Algeria and Tunisia are exposed to low risk with minimal exposure to risk from consumption of intermediate inputs and fixed capital and low agricultural exports. Although both Tunisia and Morocco have high shares of food exports of high-value products such as fruits, vegetables, olive oil and dates, Morocco faces an intermediate high degree of exposure to risk because of its more labour-intensive production and risk associated with the availability of intermediate inputs.	Similar to the exposure to supply shocks, the degree of exposure to demand risks varies among the Maghreb countries. Algeria faces a high degree of exposure to demand risk because of its relatively high share of food expenditure and relative higher dependence on food imports. Morocco and Tunisia are exposed to intermediate low risk with relatively lower food import dependency.
Iraq (High risk) Lebanon, Jordan (intermediate high risk) Palestine (High risk), Syria	Jordan, Syria and Palestine are subject to a high degree of exposure while Iraq and Lebanon face a low to intermediate low degree of exposure. Yet with new projections for 2021 of harsh economic contraction, Lebanon might still be at high risk. As a conflict-affected country, Syria faces a high degree of exposure to supply risk. Iraq, with limited agricultural exports, faces a low degree of exposure.	Iraq, Jordan and Palestine face an intermediate high to high risk of exposure to demand risk because of a high share of imports. Syria's exposure is exacerbated by the crisis, while Lebanon is exposed to risk because of a relatively high share of food imports and its financial crisis.
Djibouti (High Risk) Yemen (High Risk)	Djibouti faces a high degree of risk exposure to COVID-19 supply shocks. Yemen is exposed to intermediate low risk due its low share of agricultural exports.	Both are exposed to a high risk of demand shocks. This may be down to the inability of the governments of these countries to provide sufficient social protection to shield the poor from the consequences of COVID-19.
Egypt (High Risk)	Egypt successfully secured the availability of food through imports, domestic production and food reserves of major staples. In addition, the onset of the crisis coincided with the winter season harvest with a good harvest of wheat expected. Egypt faces a minimal level of exposure to supply risk. Egypt is also gradually introducing digitalization in farm production, though at early steps.	With high food import dependency, a relatively high share of food expenditure, particularly for those of low income and with high rural and urban poverty, Egypt faces a high degree of exposure to demand shocks. The government has taken a host of measures to mitigate the adverse effect of the crisis on households and on the business, banking and financial sectors.

\* Between parenthesis () is the possible extent of COVID-food related shock exposure as suggested Schmidhuber et al., (2020) based on a set of indicators as share of intermediate inputs, consumption of fixed capital per agricultural worker, gross output per agricultural worker, share of agricultural exports, overall exposure to supply shocks, share of food expenditure per capita, share of agricultural exports, and overall exposure to demand shocks.

Source: FAO (2020) with minor amendments.

**Table 5: Food Trade Related Adopted Measures in Response to COVID-19 in MENA Countries (as of end of January 2021)**

Country	Type of Measure	Affected Products	Effect on Trade	Affected Partner	Status	Start Date	End Date
Algeria	export prohibition	food products, medicines, medical supply products	Restrictive	All countries	active	3/22/2020	Unknown
Egypt	Export prohibition	beans, peas, lentils	Restrictive	All countries	active	3/31/2020	12/31/2020
Egypt	Prohibitions/ restrictions of imports for SPS reasons	garlic, carrots and green ginger	Restrictive	China	active	2/9/2020	Unknown
Iraq	Additional import duties	agricultural products, gypsum	Restrictive	All countries	active	4/2/2020	4/1/2022
Jordan	Prohibitions/ restrictions of imports for SPS reasons	animal and plant-based products	Restrictive	China	Active	2/2/2020	Unknown

Country	Type of Measure	Affected Products	Effect on Trade	Affected Partner	Status	Start Date	End Date
Jordan	Export prohibition	food products	Restrictive	All countries	Terminated	4/6/2020	4/22/2020
Kuwait	Export prohibition	foodstuffs, medicines, medical supplies and equipment	Restrictive	All countries	Active	3/12/2020	Unknown
Morocco	Tariff reduction	wheat, lentils, chickpeas, beans and dried beans	Liberalising	All countries	Active	4/1/2020	12/31/2020
Oman	Export prohibition	onions, garlic, flour, and wheat	Restrictive	All countries	Active	4/2/2020	Unknown
Saudi Arabia	Duties on imports are postponed	all imports	Liberalising	All countries	Terminated	3/31/2020	6/30/2020

**Table 5: Food Trade Related Adopted Measures in Response to COVID-19 in MENA Countries (as of end of January 2021) (continued)**

<b>Country</b>	<b>Type of Measure</b>	<b>Affected Products</b>	<b>Effect on Trade</b>	<b>Affected Partner</b>	<b>Status</b>	<b>Start Date</b>	<b>End Date</b>
Syrian Arab Republic	Export prohibition	food commodities, sterilization and cleaning materials	Restrictive	All countries	Terminated	4/5/2020	5/4/2020
Turkey	Licensing or permit requirements to export	lemons	Restrictive	All countries	Terminated	4/7/2020	8/7/2020

Source: ITC (2021), <https://www.macmap.org/Covi>