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# FOOD SECURITY IN IRAQ

## IMPACT OF COVID-19

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WITH A SPECIAL FEATURE ON [DIGITAL INNOVATION](#)

JUNE - AUGUST 2020





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## EXECUTIVE SUMMARY

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Novel coronavirus (COVID-19) cases continued to rise in Iraq; as of 31 August, there were 231,177 reported cases, a caseload that is almost five times that of 30 June, with 6,959 fatalities. Movement restrictions to contain the virus continued to have a cascading impact on livelihoods, particularly those of casual laborers and low-income workers, endangering small and medium sized businesses, including those operating in the food and agriculture sector.

Globally, COVID-19 mitigation measures contributed to an economic slowdown that negatively affected oil prices. Oil prices partially recovered after April; however, Iraq will need the price to increase to at least USD 58 per barrel to in order to meet its wage and pension obligations. In the current economic climate and due to Iraq's dependence on oil for its state revenue, the budget deficit is projected to surge to 19% of GDP by end-2020, compared to around 4% in 2019.

The number of households with insufficient food consumption fluctuated over the past two months, driven mostly by improved consumption levels around Islamic holidays that is attributed to increased charitable giving. After Eid al Fitr festivities, the number of households with insufficient consumption peaked at 9% in July (3.5 million people). Around Eid al Adha in August, the share of households with poor food consumption decreased to 7%, but has since risen. Additionally, around 5.3 million people are using negative coping strategies to meet their food needs, a slight increase from the 12% reported in the first issue of this report.

Food access issues will likely continue as livelihood sources in the private sector have taken a hit; over 90% of small and medium enterprises in the food and agriculture sector reported being severely to moderately affected by the pandemic. To cope with decreased revenue, more than 50% either let staff go or reduced salaries, eroding income sources and decreasing their ability to meet their food needs. In response, the government introduced a number of measures to support vulnerable households, such as the Minha grant programme. However, the strained state budget has already begun to affect social protection programmes, including the Public Distribution System (PDS). Ample domestic production replenished wheat grain stocks for the PDS, but a lack of funds hampered the Ministry of Trade's procurement of vegetable oil and sugar for the majority of households.

Food availability remained stable due to steady international food trade flows and favorable domestic production. Food market functionality and households' access to food improved compared to April just after the start of the outbreak, although price stability remained a concern. Basic commodity food prices did not undergo any significant changes; however, vegetable – particularly tomato – prices fluctuated wildly over the past few months. Although the government continued to enforce import bans for 24 agriculture products, including vegetables, to limit foreign competition during the high season and to support prices, inter-governorate movement restrictions and good harvests resulted in significant price drops in agriculture-producing governorates as the commodities oversupplied the local markets.

This report identifies policies and regulations to mitigate the impact of COVID-19, while recognizing that this crisis could be leveraged as a catalyst for reform. Diversifying import sources, investing in a food security early warning system and restructuring social protection policy can increase the resilience of Iraq's agriculture and food system to current and future shocks. This is also an opportune moment to introduce digital innovation to improve food security as physical distancing measures are enforced. The Government of Iraq has been committed to improving Iraq's digital environment by adopting enabling policies, training the workforce and investing in the necessary infrastructure; however, progress has been slow and requires concentrated efforts. With a special segment focused on opportunities for digital transformation along the food supply chain, this report reviews the current status of Iraq's digital ecosystem, and identifies innovations along agriculture and food value chains that have been successfully introduced in Iraq, the region and the world.



Photo/ Emilienne Malfatto





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## Acknowledgements

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Under the guidance of Dr. Salah Hajj Al Hassan (FAO), Abdirahman Meygag (WFP), Asif Bhutto (WFP), Abdelkarim Sma (IFAD) and Tim Robertson (World Bank), a core team of experts from each agency contributed data and analysis to this report: Hadi Fathallah (WBG/IFAD), Fawad Raza (WFP), Sharon Rapose (WFP), Rene Verduijn (FAO), Monika Tothova (FAO), Sarah Barnhart (FAO) and Nadim Khouri (FAO). The team extends special thanks for insights from Khalid Shlash (FAO), Aseel Abdulhameed (FAO), Farooq Malazada (FAO) and Sami Bilal (FAO), Saman Ahmed (WFP), Nawaf Alawy (WFP) and Bashar Alhammami (WFP), Armine Juergenliemk (World Bank), Eva Hasiner (World Bank) and Fatma El Zahraa Yassin Aglan (World Bank).

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# I. POLICY RECOMMENDATIONS

## IMPORT SOURCE CONCENTRATION AND DIVERSIFICATION

Almost two-thirds of all Iraqi food imports originate from four countries in the region -- United Arab Emirates, Turkey, Iran and Syria. In the absence of alternative suppliers, Iraqi value chains are vulnerable to supply chain disruptions in any of the sourcing countries. Although these countries have not introduced new, significant export restrictions since initial measures at the onset of the pandemic, there is a prevailing risk that exporting countries might choose to implement food trade policies that ensure sufficient supplies for their respective domestic markets. Thus, Iraq should consider diversifying its import sources and continuing to invest in domestic production to reduce risks of sudden changes in food export policies among trade partners.

## IMPROVING MOBILITY OF FOOD SUPPLIES ACROSS BORDERS AND INTERNALLY

There is evidence that movement exemptions extended to farmers, agriculture workers, agricultural product transporters and other members of the sector ensured a consistent supply of food in the country; however, obstacles remain and continue to emerge. Mobility within the country is reportedly still an issue at two levels: (i) passage of agricultural products across provinces; and (ii) producers who lack the required registration/documentation required to pass checkpoints to access their farms and transport their products to market. Addressing these two challenges could help facilitate product mobility in country to decrease the risk of food waste and financial and economic loss, in addition to increasing overall food availability.

## ENABLING AGRI-FOOD SMALL AND MEDIUM ENTERPRISES (SMES)

As important actors and aggregators within the food value chain, the government is encouraged to explore measures that enable agri-food SMEs to adapt to COVID-19 and be better prepared for future shocks. For example, temporary wage subsidies or tax suspensions would allow SMEs to retain workers or employ additional staff despite declining revenue. Such measures should target sectors with high labor demand and offer jobs to women and youth (including food services and restaurants). Additionally, supporting internal trade movement, particularly for agriculture input and food products, would benefit SMEs.

## INVESTING IN MULTI-DISCIPLINARY MONITORING AND NATIONAL EARLY WARNING SYSTEMS FOR FOOD AND AGRICULTURE

Current uncertainty and limited knowledge about the effects of COVID-19 highlight the need for dramatic efforts to improve the extent, scope, volume and quality of data collected on food security and food systems. The required information systems cover all aspects of food security, including agricultural production, livestock, water, trade, prices, market functionality, health and nutrition. There remains a need for further collaboration between government and international agencies, as well as between Ministries themselves, to develop a National Early Warning System that regularly brings together key data sets on Iraq's overall food supply and demand for in-depth analysis and policy recommendations. Specific attention needs to be given to the impact of COVID-19 on critical infrastructure, services, support functions, and governmental and other actors in the agri-food sector.

## TURNING FISCAL STRESS INTO POLICY REFORM

Lower oil prices and reduced oil demand are placing additional stress on pre-existing structural economic challenges in Iraq, such as those faced by the current subsidy and social protection programs. As the government grapples with COVID-19 and its impacts, it cannot maintain current blanket subsidy programmes. The government needs to consolidate scarce financial resources to best target the vulnerable and food insecure. For example, Iraq has a window of opportunity to transform the Public Distribution System (PDS), the main subsidy program, and redirect savings to sustainable development, such as support to private sector development.



## DEVELOPING A SINGLE REGISTRY FOR SOCIAL PROTECTION PROGRAMMES

Various ministries and development actors operate social protection programmes; however, they are not aligned with each other. The schemes may over-serve some citizens and under-serve others. Socio-economic challenges arising due to COVID-19 highlighted such issues. A single registry is needed to revitalize the social protection system and ensure interoperability and the flow of information across various safety net data silos to improve monitoring, resource allocation and targeting.

## INTEGRATING CONFLICT SENSITIVITY INTO THE RESPONSE

Government, development and humanitarian actors should increase attention on the link between food security, conflict and social cohesion, particularly given the potential for COVID-19 to act as a conflict driver in an already fragile context. Monitoring should be prioritized to improve the evidence-base for how COVID-19 is affecting food security, conflict and social relations, both at community and national levels. Monitoring should focus on transparency, accountability and communication of interventions and how the dynamic situation affects conflict drivers, actors and power dynamics. Findings can then be translated into relevant, conflict-sensitive responses, building on local voices. Lessons learned from the pandemic in terms of conflict sensitivity risks and dynamics will improve responses for future shocks.

## MITIGATING COVID-19 TRANSMISSION

As a best practice, personnel working at the borders and internal checkpoints should be trained on COVID-19 mitigation measures and provided with protective equipment. As control measures continue to be enforced at borders and governorate crossing points, it may also serve as a catalyst for the government to invest in contact tracing, updating quality standards and capacity development to manage risks.

## UNLOCKING DIGITALIZATION TO TACKLE COVID-19 AND TRANSFORM AGRICULTURE

In light of COVID-19, digital solutions are more important than ever to allow governments, agencies and the private sector to adapt their operations to the "new normal", particularly physical distancing requirements and movement restrictions. Adopting these tools mitigate the impact of COVID-19, and also improves resilience against future shocks. Limited access to digital technologies in the rural areas may widen the digital divide and inequalities if smallholders are unable to make use of these innovations due to limited connectivity, high cost, and/or specialized skills needs. Harnessing the power of digital requires that the government invests not only in underlying infrastructure that enables digitalization, but to provide enabling environments that would allow adoption from the grassroots to government level, thus allowing for digital strategy to decrease transactional costs and remove information asymmetries.



## II. SOCIOECONOMIC CONTEXT

This section describes relevant developments globally and nationally that took place since the [April to June edition of the report](#), published on 2 July 2020, and remain largely valid as of the publication of this report.

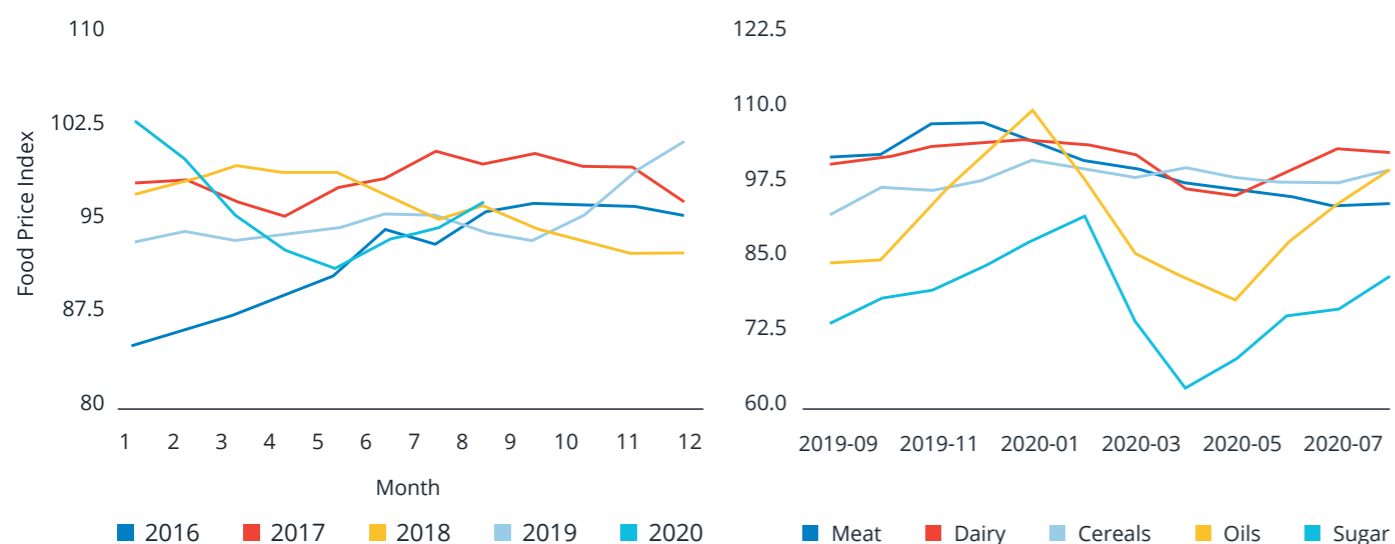
### A. GLOBAL COMMODITY PRICES

Collapsed demand decimated oil prices as the world continued in economic slowdown, driven by measures to contain the spread of COVID-19. This resulted in fiscal challenges for countries relying on oil as the main source of foreign currency and income, such as Iraq. Although energy prices increased by 5.5% in August supported by a 3.1% increase in crude oil prices, the energy index remained well below end-2019 levels. The average crude oil price reached a bottom of USD 21 in April 2020, gradually recovering to USD 43.4 in August. (In 2019, crude prices averaged USD 61.34 per bbl.<sup>1</sup>)

Following five months of decline between January and May, global food prices rose for a third consecutive month in August, led by sugar and vegetable oils. Cereal prices remained steady. The FAO Food Price Index<sup>2</sup> (FPI; Figure 1) averaged 96.1 points in August.

Wheat prices remained steady, changing little month-to-month. Wheat registered only a 2% increase compared to July 2019 despite a weaker US dollar, slow trade activity and production concerns in the European Union (EU), the Black Sea Region and Argentina. In the wheat markets, export prices rose, albeit slightly, as lower production prospects in Europe and increased buying interest started to push up prices towards the end of the month. Among the major cereals, sorghum, barley, maize, and rice prices rose the most. Sorghum prices increased significantly for the second consecutive month, up 8.7% from July and 33.4% above August 2019 levels, mostly on the back of strong import demand from China. Barley prices also picked up strength, increasing by 3.2% month-on-month, reflecting a faster pace in exports from Argentina to China. Concerns over production prospects in the US following crop damages in Iowa pushed maize prices up a further 2.2% in August. International rice prices also rose after two months of successive declines, underpinned by seasonal production decreases and increasing African demand.

**Figure 1:** Food Price Index (FPI) where (i) is the overall FPI by month from 2016 to 2020 and (ii) is the FPI by staple commodity from August 2019 to July 2020. The FPI measures the monthly change in international prices of a basket of food commodities, weighted by the average export shares of each group from 2014 to 2016.



**Table 1:** Weekly export cereal quotations as of 1 September 2020 (Source: FAO)

	As of 1 September 2020	One Week Ago	One Month Ago	One Year Ago
Wheat (US No 2, HRW)	247	229	218	190
Rice (Thai 100% B)	n.a.	541	499	449
Maize (US No.2, Yellow)	161	157	142	156

### B. GLOBAL AND BILATERAL TRADE

The pandemic has affected a large number of countries, including top exporters of food products. A World Bank database<sup>3</sup> shows that the countries most affected by COVID-19 are also the top 50 exporters, accounting for an average of 66% of the world's food supply. Their share of world exports ranges from 38% in stimulant crops (e.g. coffee, tea) to more than 75% in vegetable and animal oils, fresh fruits, and meat (Figure 3). The EU, Turkey, Canada and Australia are among the top 10 economies affected by the pandemic and are major food exporters to Iraq; they represent 91% of the world's exports of oats, roughly 65% of rye and barley and over 40% of wheat and meslin. Thailand, also a direct trading partner of Iraq, supplies 24% of the world's rice exports. The World Bank continues to monitor the relationship between COVID-19 cases and resolution of food supply challenges given the interdependence of world food markets.<sup>4</sup>

In accordance with Article XI of GATT-94 of the World Trade Organization (WTO), some countries introduced temporary bans on food exports at the initial stages of the pandemic to ensure steady supplies for their domestic market (Figure 2);<sup>5</sup> however, the majority of measures have been lifted. The WTO Agreement on Agriculture requires that countries consider global food security when contemplating such temporary export restrictions to avoid food supply disruptions.<sup>6</sup> Turkey and Iran, major food suppliers for Iraq, have not announced any changes in their food trade policies; Turkey's only remaining restriction (limiting lemon exports) expired 31 August.

In Iraq, the government temporarily closed borders with Iran, Kuwait and Saudi Arabia in mid-March, challenging the supply chain to find alternate sources for certain food items. The closures placed additional pressure on border crossings that remained open, namely Ibrahim Khalil (between the Kurdistan Region (KR) and Turkey), Trebil (Iraq and Jordan) and Umm Qasr port in the south. These crossings have been functioning at full capacity; however, strict measures to contain spread of COVID-19 are enforced, continuing to cause long queues and longer transportation times. For example, Turkish and Jordanian trucks have not been allowed to enter Iraq, requiring truck-to-truck cross docking. Recently, other border crossings started to open to food and medical supplies. By the end of July, five border-crossing points with Iran opened, in addition to the border crossing points with Kuwait and Saudi Arabia.

Food exports from Iraq occurred without incident, but Iraq continued to enforce import restrictions on certain food and agricultural products in an effort to protect prices during the periods of high domestic production, including for frozen chicken, fresh eggs, fish, and certain types of vegetables and fruits, coinciding with production calendar in Iraq. Currently, the ban covers 24 products.



## A. NATIONAL FISCAL SITUATION

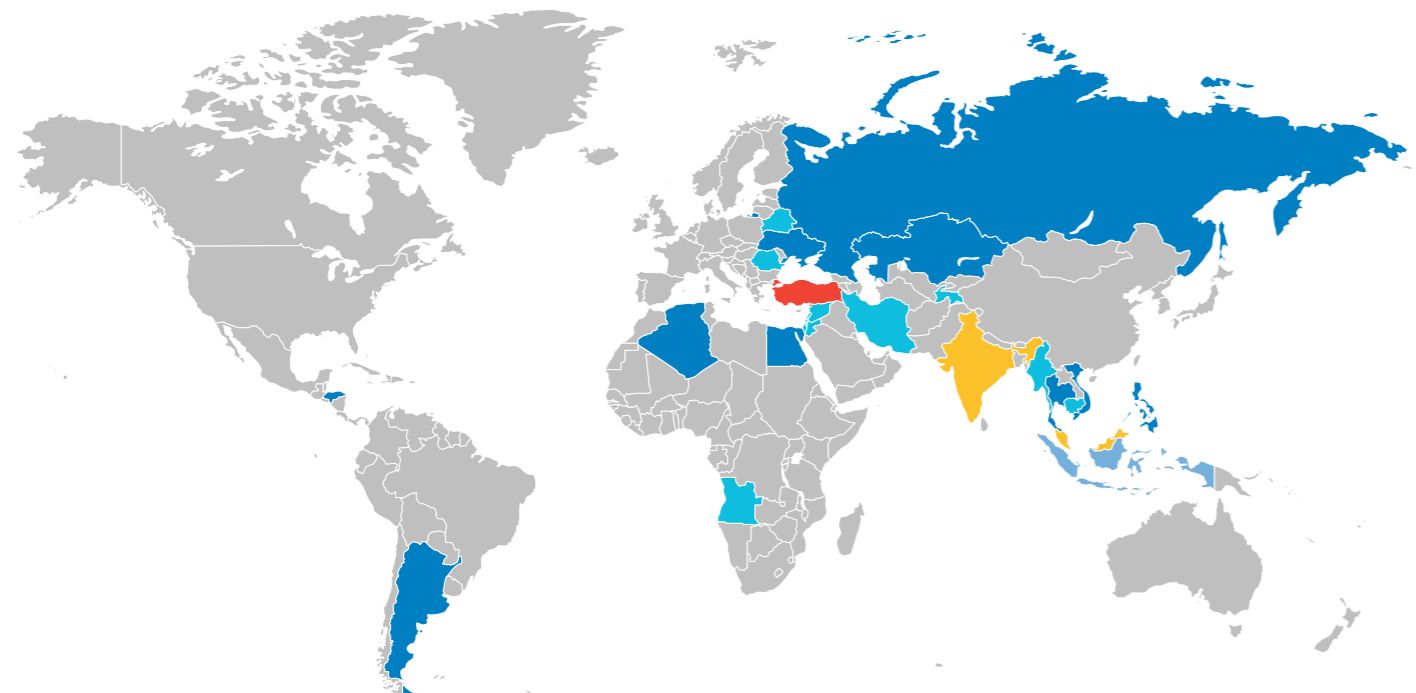
Despite the slow upturn in global oil prices since April, the fiscal and monetary situation in the country remained precarious due to uncertainty about the speed of the global recovery, and deficits created at the time of depressed oil prices. Oil revenues account for approximately 90% of the state's total revenue. The collapse of international oil prices coupled with persistent political and social turmoil, restricted the fiscal and monetary tools available to the Government to carry out financial obligations and attend to different socio-economic challenges, including the COVID-19 response.

Iraqis continued to protest poor services and a lack of opportunities, including electricity cuts during the summer heatwave.<sup>7</sup> Public sector and state organization reforms have been challenged by COVID-19; however, the government has ordered investigations into potential misconduct by the Ministry of Electricity and announced stimulus packages to respond to the citizens' requests.

Continuing to work without an official budget since the beginning of the year, and in the absence of planned economic consolidation measures and reforms, the budget deficit is projected to surge to 19% of GDP by end-2020, compared to around 4% in 2019. The government is expected to face a severe financing gap that could postpone infrastructure projects, limit post-COVID-19 recovery measures and place public sector employees and pensioners' wages in jeopardy. The gap is expected to be financed by the Central Bank of Iraq's reserves and state-owned banks, in addition to local borrowing from local private banks; however, the fiscal situation remains precarious in the current economic climate.

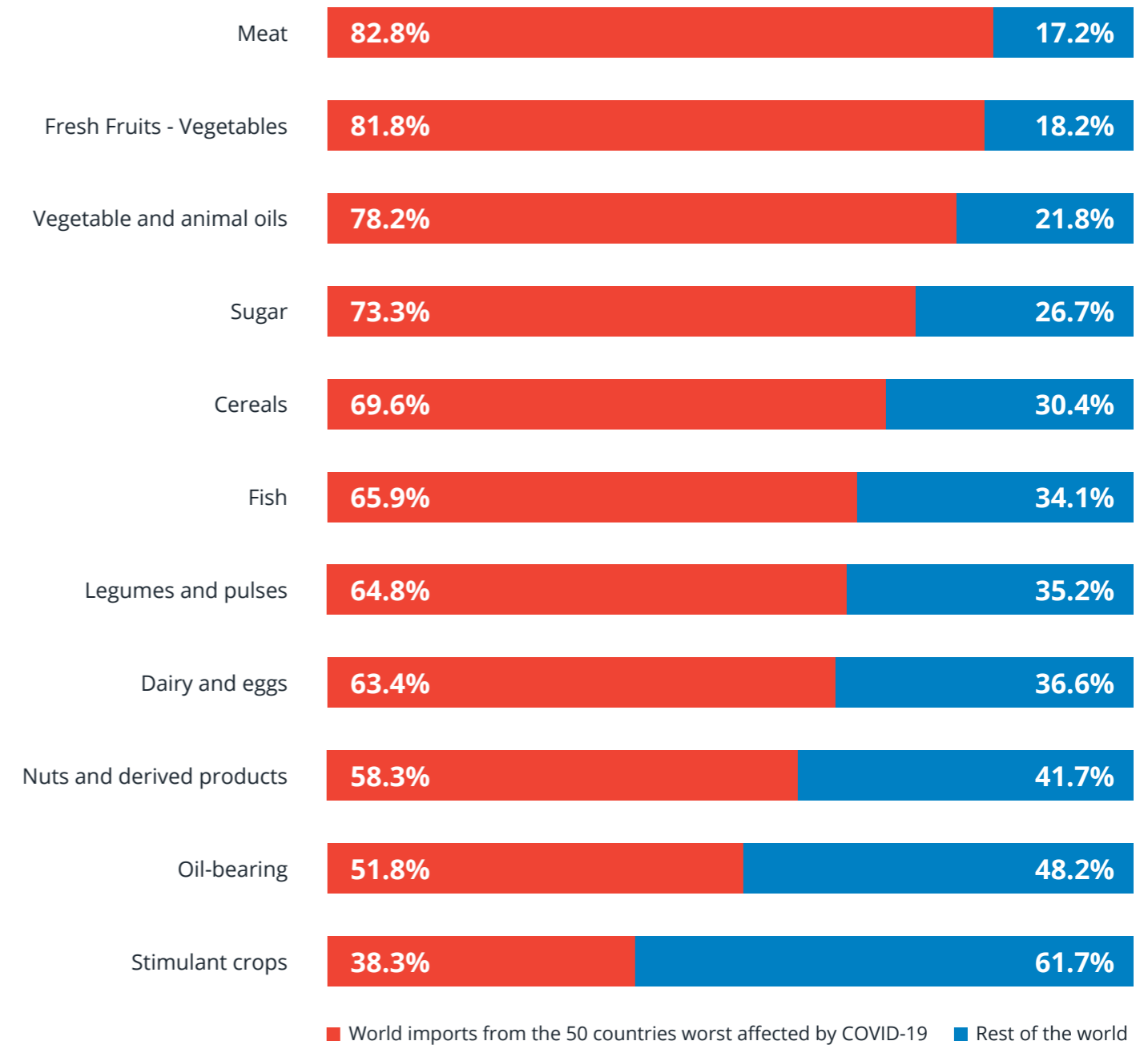


**Figure 2:** Agriculture and food export restrictions imposed after COVID-19 pandemic. 31 jurisdictions imposed 49 export controls since the beginning of 2020 (updated 7 August; Source: Global Trade Alert, European University Institute, World Bank).



■ January measures   
 ■ February measures   
 ■ March measures   
 ■ April measures   
 ■ May - Aug measures

**Figure 3:** World imports from top 50 countries most affected by COVID-19 as of August 2020 (Source: Espitia et al. (2020), "Database on COVID-19 trade flows and policies" World Bank).



## B. SUBSIDIES AND SOCIAL PROTECTION

Although MoA and the Ministry of Trade (MoT), among the other ministries, continued to subsidize parts of the value chain, social safety nets are crumbling under the fiscal pressure. The PDS – the food basket distributed to all Iraqis and managed by MoT – has been facing severe challenges to ensure consistent distribution of the four food basket commodities, though availability differs by geographic area.<sup>8</sup> MoT locally purchased approximately 5.1 million tons of wheat this season and has been distributing flour through its network of mills and distributors, albeit with a one-month delay. MoT started paying some farmers for wheat marketed in 2020, although it has yet to complete payments for the previous year's purchases in some governorates. The fiscal stress on the government budget remains a major challenge for wheat marketing, as the minimum government purchase price exceeds market prices. The lack of funds has also limited the MoT's ability to purchase other commodities provided by the PDS (i.e. sugar and vegetable oil).

The government introduced new social protection schemes in response to COVID-19 on an ad hoc basis. The Ministry of Migration and Displacement (MoMD) distributed roughly 250,000 relief packages to internally displaced people across the country in July, including 104,551 food baskets. The Kurdistan Region Government (KRG) distributed USD 11.7 million (IQD 14 billion) to 140,000 vulnerable households in Duhok, Sulaymaniyah and Erbil after Eid al Adha, where each household received a one-time disbursement of IQD 100,000.



# III. FOOD AVAILABILITY AND STABILITY

## A. FOOD PRODUCTION

Harvesting of winter wheat and barley, the two most important cereal crops in Iraq, concluded in June. Grain purchasing continued throughout July and, in some governorates further north, into early August. MoT's General Company for Grain Trade received over five million tons of wheat in the government silos, of which 88% was classified as high quality (first class). In the KR, the government silos received the full allocation of 390,000 tons. According to the KRG, wheat production in 2020 was estimated at 2.43 million tons, so the remainder was sold on the local market or stored.

The summer agriculture season progressed, with the main crops being irrigated rice, corn, cotton, vegetables and fruits, including dates. In April, the MoA and Ministry of Water Resources (MoWR) approved the summer 2020 National Agricultural Plan (NAP), which established the areas where farmers could plant with specific crops. The NAP balances domestic needs, import requirements and water resource availability (particularly for the irrigation-dependent summer season), incentivizing farmers to follow the plan by offering subsidized inputs and marketing opportunities. For the 2020 summer season, the NAP allowed farmers to cultivate 662,632 ha, of which only 129,172 ha could depend upon groundwater resources. The MoA banned agriculture cultivation along the borders of the marshes and floodplains in Basrah, Diyala, Thi Qar and Wasit Governorates to protect the fragile ecosystems.<sup>9</sup> In the KR, rice and maize are the dominant summer crops, with 6,971 ha and 6,229 ha cultivated respectively across the three governorates. Last year, the region produced 22,311 and 53,800 metric tons of rice and maize respectively, with the majority of production occurring in Duhok and Erbil.

Campaigns against pest and diseases continued despite the pandemic and no major delays were reported. The MoA Plant Protection Department (PPD) recorded and responded to localized seasonal pest outbreaks throughout June and July, including date palm pests, dust mites, rodents, Tomato Leafminers, Jasmine flies and Peach flies. Due to the success of the campaigns, the majority of these operations ceased in July; however, control operations for Red Palm Weevil continued in Basra and against rodents in Diwaniya and Najaf governorates. Recently, the PPD also began a campaign against the Corn Stalk Borer across Iraq, excluding Basra, Thi-Qar and Karbala. In order to protect livestock, the Veterinary Directorate continued to implement free vaccination campaigns against foot and mouth disease in targeted areas.



Photo/ Emilienne Malfatto



FAO assessed the impact of COVID-19 on producers and government services by conducting key informant interviews (KIIs) with government officials and extension officers.<sup>10</sup> Government officials reported that COVID-19 affected a variety of producers and market actors. In one KII, unregistered farmers were identified as a vulnerable group as they do not typically qualify for government subsidies nor the government exemptions that allowed registered farmers to operate and move despite the curfew. Agriculture assistance continued according to KIIs in nine governorates. Farmers had less access to information and technical support during the pandemic. A government official in Babil shared how reduced working hours made it more difficult to communicate government decisions with farmers.

Crop and livestock producers experienced different COVID-19 challenges. In the south, KIIs focused on crop producers' lack of timely access to agricultural inputs, such as vegetable seeds, fertilizers and pesticides. Access to markets was also a challenge. Nevertheless, in Erbil and Al Muthanna production increased, although marketing remained the main bottleneck to income generation. For livestock producers, challenges included difficulties accessing fodder in Duhok and Kirkuk. Others could not access the market due to movement restrictions. In Diyala, Anbar and Kirkuk, herders could not reach natural pastures to graze their livestock. All extension officers stated that livestock owners had difficulty accessing veterinary services, either partially or completely.

Despite the variance between sectors, government officials found that a decline in consumer demand placed downward pressure on prices and led to losses. The poultry sector was singled out at the most affected sector in three governorates, particularly in Qadissiya, where the price of chicken dropped to IQD 1,400 per kg while the production cost remained at IQD 2,050 per kg. According to WFP price data, average chicken meat prices in the Qadissiya main market are IQD 3,000 per kg. Based on these findings, government officials predicted that farmers will urgently need access to inputs, access to markets and financial support over the next three months. KIIs revealed that the ability to access to land and livestock, access to information and access to water were primary concerns that should be closely monitored and addressed.

Since the start of the pandemic, government officials noted that more individuals migrated from the city to rural areas, particularly in Kirkuk and Diyala, probably to avoid crowds. Many informants attributed the increase in agriculture production to migrating households who resumed agricultural activities. Despite population movements and an increase in production, the majority of government officials did not perceive that social conflict or disputes over access to natural resources increased. Only one extension officer reported that since movement restrictions had been enforced, disputes and/or conflicts over access to land and water had occurred. Although these occurred prior to the pandemic, they were a rare occurrence.

Nevertheless, the impact of food availability, affordability and access can have wide reaching influence on relationships between and within communities and should be closely monitored. Food insecurity can inflame tensions or increase social unrest. For now, it is difficult to determine the real impact COVID-19 is having on social cohesion in Iraq, but findings from other countries indicate that the cycle of food insecurity and risk of conflict could increase due to the pandemic. Risks include looting and rioting, grievances related to targeting and beneficiary selection for the COVID-19 response, and negative perceptions towards government and implementing agencies. Moreover, non-state armed groups could take advantage of the diverted government attention or try to divert aid resources for their own gain. Rising unemployment and inequality could potentially become a push factor to join armed groups.



## B. FOOD IMPORTS AND RESERVES

Iraq has become increasingly dependent on food imports to meet domestic demand; between 1985 to 2017, food imports increased from USD 2 billion to 11 billion (from 19 to 21% of total imports), driven by population growth.<sup>11</sup> Despite the successful 2020 wheat harvest, Iraq is still likely to import wheat to boost its strategic food reserves.<sup>12</sup> On the other hand, the Parliament Agriculture Committee announced that it will be exporting 900,000 tons of winter barley as production has exceeded domestic requirements.<sup>13</sup>

The import and export of agriculture inputs, products and food items continued despite COVID-19 lockdowns; however, national supply chains have been negatively affected over the past few months. As well as limited border crossings and reduced government working hours, three other factors may continue to affect the food supply chain, including the humanitarian relief supply chain. First, ongoing airstrikes between the Turkish/Iranian and KR border areas increased the risk of supply chain and trade disruptions; however, as of this report, no direct impact has been reported. Second, MoA continued to impose import restrictions on certain food items, in addition to restricting the movement of these goods between the KR and federal Iraq. The federal government and KRG continued negotiations to introduce a mechanism to monitor border crossings in the KR, part of approaches to centralize and unify import procedures. Third, in an anti-corruption effort, the government deployed security forces to 14 border crossings; the Iraqi army is now responsible for the crossings.<sup>14</sup>

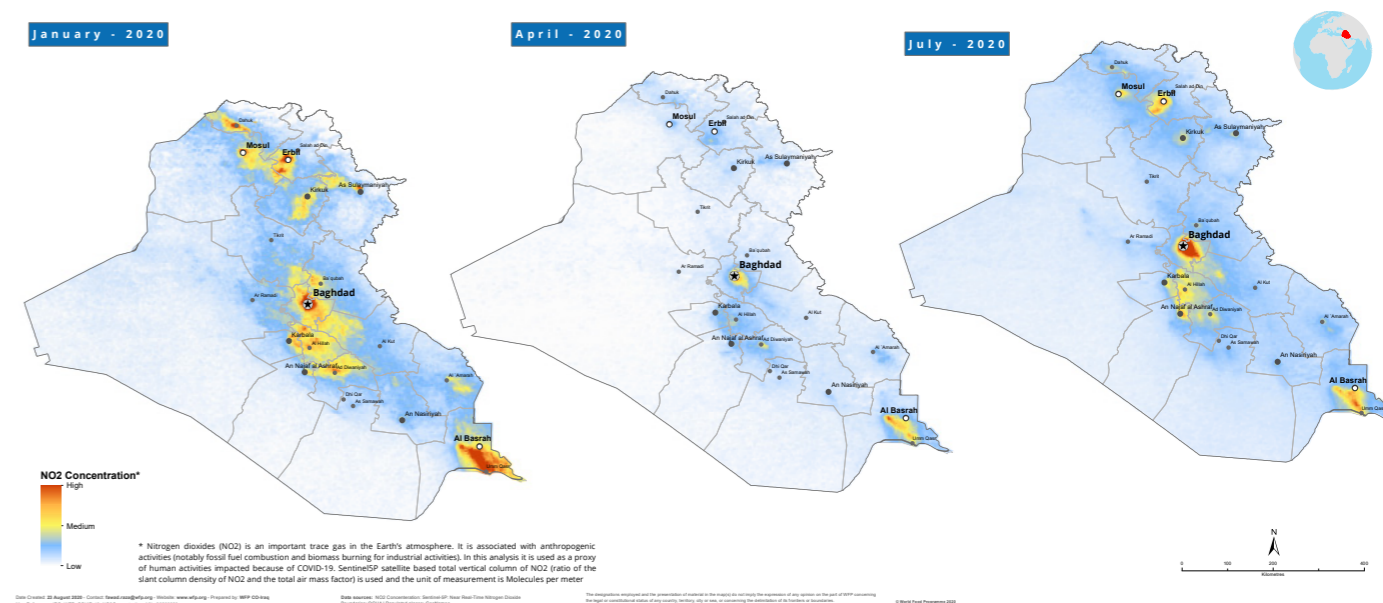


# IV. FOOD ACCESS AND STABILITY

## A. LABOR AND BUSINESS SENTIMENTS IN THE FOOD AND AGRICULTURE SECTOR

Economic activity gradually resumed across the country, particularly around urban centers. WFP analyzed the concentration of monthly median nitrogen dioxide (NO<sub>2</sub>) derived from satellite imagery. NO<sub>2</sub> is an important trace gas that is linked to anthropogenic activities, specifically industrial fossil fuel and biomass combustion. Compared to April's strict lockdowns, higher concentrations of air pollutants were observed in July, especially around metropolitan areas such as Baghdad, Basra, Erbil, Ninewa, Karbala and Najaf, indicating that markets and economic activities have been recovering, although not yet to pre-COVID-19 levels (Figure 4).

Figure 4: Concentration of nitrogen dioxide (NO<sub>2</sub>) in April and June 2020 as a proxy indicator for economic activity (Source: WFP).



According to an IOM, FAO and ITC study,<sup>15</sup> 91% of small and medium enterprises (SMEs) in the food and agriculture sector reported that their business operations were moderately or strongly affected by the pandemic, primarily due to temporary shutdowns (83%), reduced logistics services (33%) and clients not paying their bills (23%). Fifty-three% of businesses stated that they had issues sourcing products domestically, and 75% shared that they experienced lower domestic sales. In response, SMEs temporarily reduced employment, including not paying salaries (31%), and permanently letting go of employees (13%). Men and women were equally affected by staffing reductions; however, the gender gap in the food and agriculture sector was already wide. 57% of businesses reported that they were at risk of permanently shutting down, 24% within three months or less and 33% in six months or more. SMEs did identify government measures that would help them cope with the COVID-19 crisis, suggestions included lockdown exemptions<sup>16</sup> for certain sectors (68%), rent subsidies (51%) and support to self-employed individuals (44%). Indeed, lockdown exemptions for certain sectors would greatly support SMEs.

FAO also conducted an online survey with 71 vendors countrywide to understand how COVID-19 affected agribusinesses and farmers' access to inputs.<sup>17</sup> The majority of vendors stated that their operations continued despite the pandemic. 71% of vendors offered the same range of products compared to the same period last year; however, 91% reported difficulties transporting goods and had to change their suppliers. Many vendors reported that costs decreased or remained stable (58%), and 45% stated that their prices increased. Demand also shifted; 83% of vendors experienced a moderate to strong decrease in sales over the past month. Vendors also perceived that client demand changed (93%), with a decrease in the number of clients and quantity of products purchased, shift in types of products purchased and increased preference for cheaper products. Around 73% also stated that clients bought slightly or a lot more on credit. The majority of vendors were willing to offer this service to maintain their consumer base.



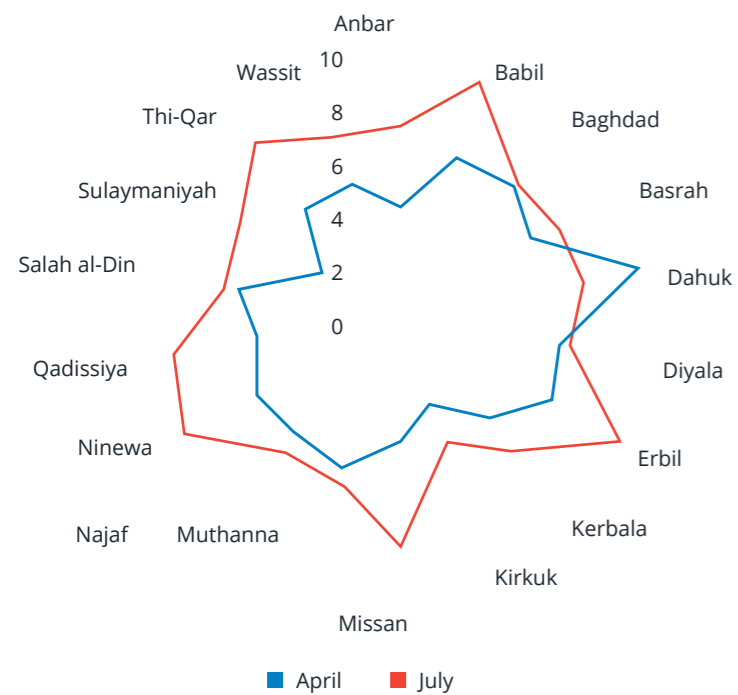


Although government KIs identified access to inputs as a major limiting factor for farmers, these results suggest it is more a symptom of being unable to afford inputs, rather than vendors not being open for business or able to supply the necessary goods. Nevertheless, this may evolve; 41% of agriculture vendors were unsure whether they would need to alter their prices, or whether they had sufficient supplies for the upcoming month. The majority of vendors (45%) anticipated facing greater difficulties operating their business in the coming month. Many agriculture businesses did not anticipate having to shutter their business in the next three months; however, around 32% were uncertain and 21% thought their imminent closure was likely.

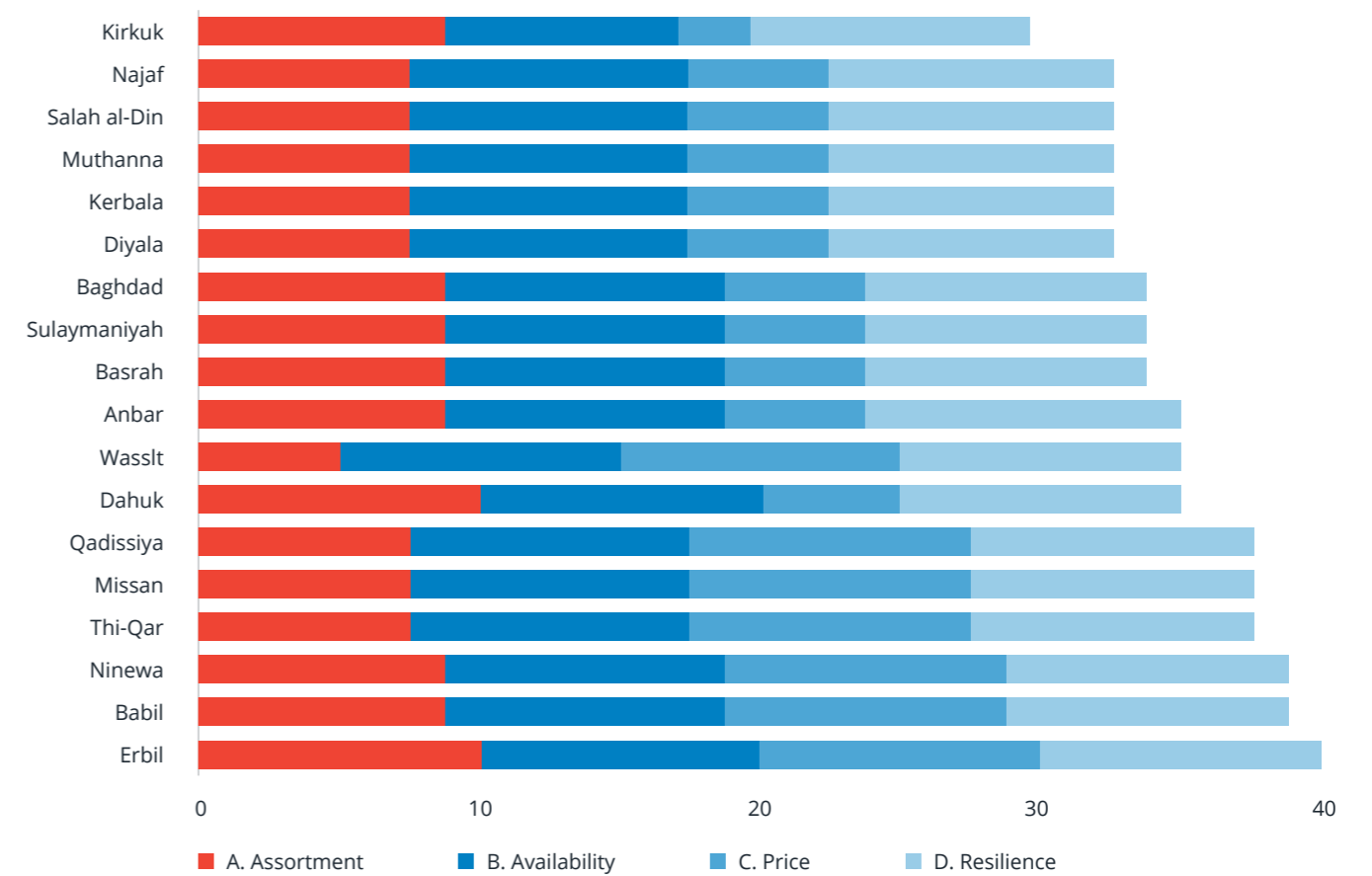
The WFP Hunger Monitoring System (previously known as the mVAM system) focused on food retailers specifically. Around 40% of retail respondents experienced a decrease in sales due to COVID-19, while 45% reported no change. Only 15% reported an increase in sales. Most retailers from Basra, Dohuk, Al Muthanna and Sulaimaniyah reported a decrease in sales, whereas most retailers in Anbar reported higher sales. The most common COVID-19 mitigation measures were providing hand sanitizer to customers and encouraging all to wear masks. Movement restrictions were identified as the biggest challenge, while some also reported reduced demand and liquidity problems.

Despite such challenges, WFP's mobile Market Functionality Index (mMFI) revealed that the market functionality is improving across the country. When comparing April MFI (Round 1) data with July (Round 7), all governorates had improved overall mMFI scores (Figure 5). Of all the market dimensions, prices were the most unstable, particularly for Kirkuk (Figure 6).

**Figure 5:** mMFI scores by governorate, an indicator that analyzes four dimensions of a market (assortment of essential goods, price, availability and resilience) based on phone surveys with retailers and rates each dimension from 0 to 10, where 10 is high functioning dimension.



**Figure 6:** mMFI scores for each governorate, broken down into each of the four dimensions: multi-assortment, availability, prices and resilience.

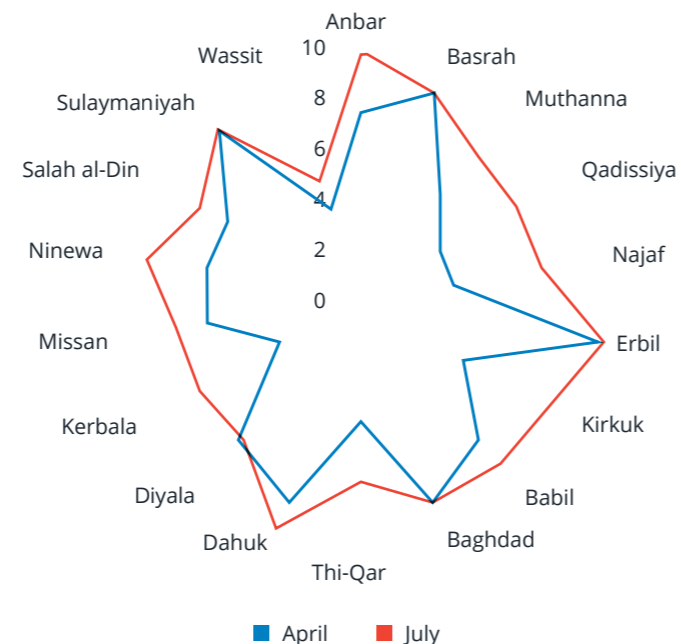




Multi-sectoral assortments: The multi-sectoral assortment score in Iraq improved across the country compared to April. Thus, people have the option to obtain a wide variety of food and non-food items. This also indicates the return of economic activities and the opening of markets carrying non-essential items (Figure 7).

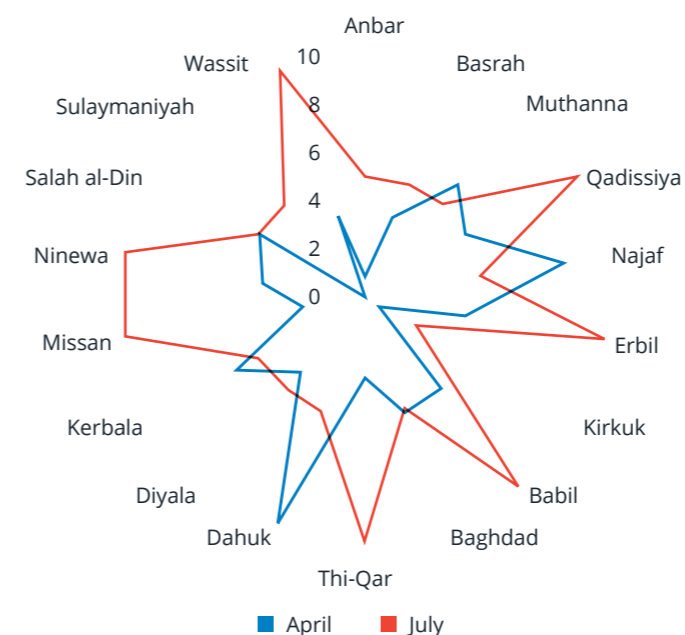


**Figure 7:** The multi-assortment dimension scores for each governorate in April and July. The multi-sectoral assortment dimension indicates which essential goods can be purchased in a marketplace and how much choice is offered. The classes of essential goods include food, shelter, basic household items, safe drinking water, sanitation and hygiene (WASH), healthcare.



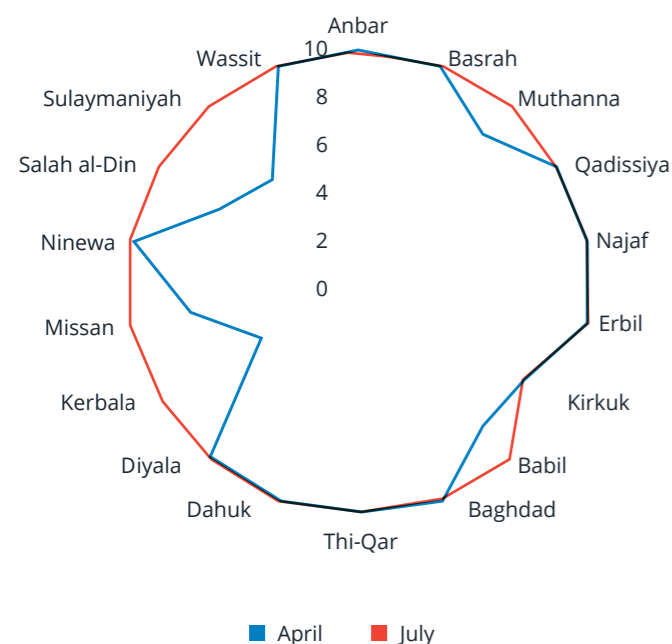
Prices: The MFI analysis of Round 7 data showed that markets in Kirkuk had the lowest price score (2.3). Wassit, Qadissiya, Erbil, Babel, Thi-Qar, Missan and Ninewa reached the maximum score of 10. Markets in Dohuk and Najaf experienced a significant negative change compared to their score in April. The main driver was price volatility; retailers were unable to predict the prices of items for the following week (Figure 9).

**Figure 9:** Price dimension for each governorate, comparing April and July scores. The price dimension of the MFI measures two basic features of the price dimension, i.e. trend/level and volatility/stability. The first is associated with price change (how prices changed as compared to the previous month) and the second with predictability (if the retailers can predict prices of the items they sell, for the following week).



Availability: The average availability score in all the governorates was 10 except for Kirkuk, where the availability score was 8.3 during Round 7 (4th week of July). Hence the availability of food and non-food items in markets was good across the country (Figure 8).

**Figure 8:** The availability dimension per governorate, comparing April and July. The availability dimension refers to the physical presence of goods in the market in sufficient quantities. It assesses whether certain products are scarce, or likely to get scarcer in the short run.



Resilience: During July, marketplaces across Iraq reported perfect resilience scores (10 out of 10), indicating that markets were responsive to the needs. The interviewed retailers reported owning enough stocks to last at least one week, and they were also confident of replenishing their stocks within one week when needed.

The Cash Consortium of Iraq (CCI) continued to conduct their Beneficiary Market Perspectives (BeneMark) Survey, complementing the other surveys by focusing on household perceptions of markets in conflict-affected areas. Every two weeks, CCI assesses 160 households, reaching 10 households per district across five governorates (Anbar, Diyala, Kirkuk, Ninewa, Salah al-Din). The survey presents a cross-section of socio-economically vulnerable households in the districts, and provides indicative results of changes due to the pandemic. Between 1 June and 3 August, data showed that the most common items purchased by households remained the same as the two months prior - vegetable oil, rice, disinfectant solution, detergent, soap. 60% of households reported an increase in the price of one or more items compared to pre-COVID-19 prices, a decrease in proportion by 10% compared to two months prior. Similarly, shortages seemed to be experienced by a smaller proportion of households (a reduction of 14%), totaling 34% of respondents. The items most frequently experiencing shortages remained the same - disinfectant, detergent, rice, vegetable oil and lentils. Over these two months, on average 4% of households reported their local shop was closed. For individuals living in areas where the local shop was closed, 17% had no access to another open shop. Thus, both mMFI and BeneMark survey results indicate that markets improved over the past few months; however, there is still a need to gather granular data to identify where shortages and access issues remain a concern.





## B. FOOD PRICE TRENDS

In July, the average price of basic commodities did not experience any significant month on month (m/m) change at a national level. However, rice prices were 14% higher compared to July last year. The most significant y/y changes in rice prices were observed in Al Muthanna (from IQD 1,000 to 1750 per kg), Qadissiya (IQD 1,292 to 1,750 per kg) and Missan (IQD 1,500 to 2,000 per kg).

Recent reports indicate that production of summer crops has been bountiful this season, and government has reiterated the importance of enforcing existing import bans and/or tariffs on agricultural products produced domestically. Despite such enabling policies, vegetable prices fluctuated over the past two months. Although seasonal price fluctuations are normal, the inter-governorate movement restriction resulted in significant price decreases in producing governorates, and price increases in consuming governorates.

For example, the average m/m onion prices decreased 15% in July, and prices were 51% lower compared to three months ago. The most significant m/m drop in onion prices was observed in Sulaimaniyah, where onion prices dropped from IQD 1,500 per kg in June to IQD 1050 per kg in July. Ninewa (from IQD 413 to 250 per kg), Najaf (IQD 750 to 550 per kg) and Anbar (IQD 750 to 550 per kg) also witnessed noticeable decreases. Meanwhile Salah al-Din observed a 33% m/m increase in onion prices (from IQD 563 to 750 per kg). Average potato prices decreased 39% compared to three months ago. The m/m average drop was 13%. The most significant drops in potato prices were in Dohuk (from IQD 938 to 500 per kg) and Najaf (IQD 750 to 550 per kg).

Tomatoes witnessed a 54% drop in average price compared to three months ago where the m/m drop was around 15%. The most significant m/m drops were in Erbil (from IQD 563 to 250 per kg), Dohuk (IQD 1000 to 500 per kg), Ninewa (IQD 388 to 220 per kg) and Najaf (IQD 500 to 350 per kg). On the other hand, Baghdad and Diyala experienced a 25% m/m price increase (IQD 375 to 500 per kg) in both governorates. This phenomenon was clearly evident among Erbil-based tomato producers. In early July, the price of tomatoes in Erbil dropped to IQD 100 per kilo in early July, and farmers responded by destroying their crop in protest. In comparison, the lowest national average price for tomatoes in 2019 was IQD 747 per kilo. The low prices were attributed to inter-governorate movement restrictions that prevented transporting tomatoes to markets with higher prices, and saturating markets in the main production areas. In response, KRG announced plans to reopen a tomato paste-processing factory to divert excess tomatoes off the market and ensure farmers can generate a profit.

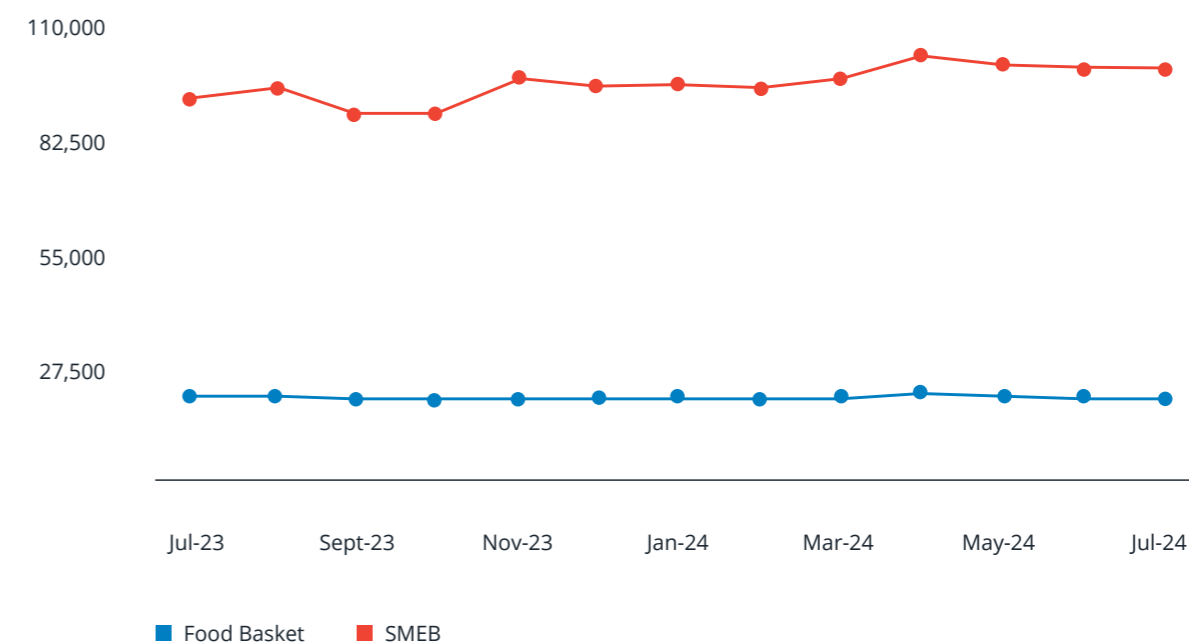
**Table 4:** Survival Minimum Expenditure Basket (SMEB) composition

	Quantity per HH	Unit
<b>Food Security Basket</b>		
Lentils	10	kg
Oil (veg)	4.55	l
Rice	15	kg
Sugar	5	kg
Bulgur	5	kg
Salt	0.75	kg
Wheat Flour	30	kg
<b>WASH Basket</b>		
Laundry detergent	1	Pack
Sanitary pads	4	Pack
Shampoo	1	Piece
Soap	6	Piece
Adult Toothbrush	3	Piece
Child Toothbrush	3	Piece
Toothpaste	1	Piece
Garbage bags	1	Roll



Compared to June, the value of the Survival Minimum Expenditure Basket (SMEB) increased by only 1% in July (Figure 10). The change is more prominent (9%) when compared with July last year.

**Figure 10:** Survival Minimum Expenditure Basket (SMEB: Food Security and WASH) compared to the Cash Based Transfers (CBT) food basket.



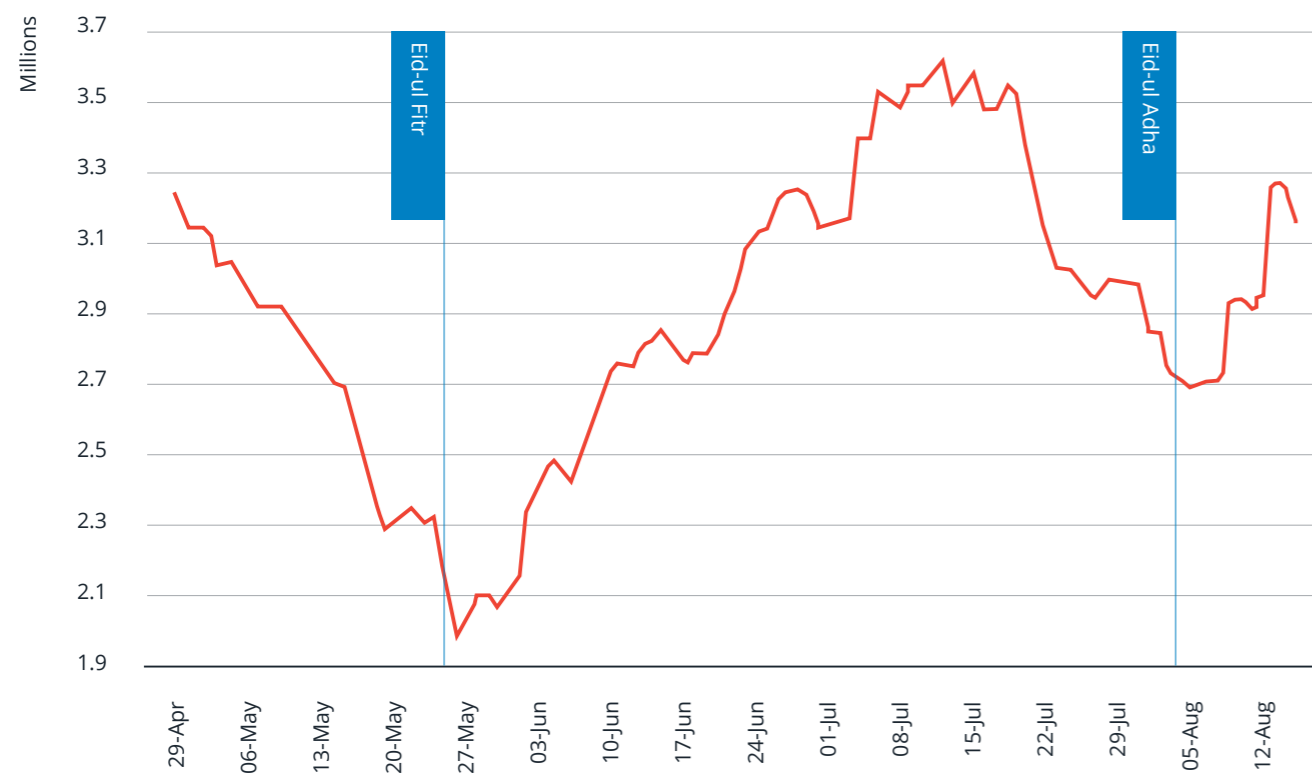


## A. HOUSEHOLD FOOD CONSUMPTION

WFP's Hunger Monitoring System (HMS) continued to collect data on household food security and generate evidence for decision-making and policy planning. The number of people with insufficient food consumption, as calculated based on seven days recall, is referred to as the Food Consumption Score (FCS). In Iraq, the FCS improved significantly around the two religious occasions, Eid al Fitr and Eid al Adha, a trend associated with increased charitable giving. Muslims engage in annual charity, known as Zakat, during the holy month of Ramadan that ends with Eid al Fitr. Wealthy people are traditionally expected to share 2.5% of all their assets with the poor every year, with the majority of giving happening during this time. Meat consumption among the poor strata also increased during Eid al Adha, where one third of the meat of animals sacrificed is customarily given to vulnerable people.

During the lockdown in April, 7% of the population had insufficient food consumption, dropping to 5% by the end of May. After Eid al Fitr festivities, that rose to 9.3% during the first week of July, but declined to around 7% during Eid al Adha in August before increasing again (Figure 11). It is worth noting that around 1.5% people were recorded with insufficient food consumption during Comprehensive Food Security and Vulnerability Analysis (CFSVA) in 2016. HMS accurately captures these two well-known phenomena, increasing confidence that the HMS can be used as a food security early warning system in Iraq.

**Figure 11:** Estimated number of people with insufficient Food Consumption Scores, as generated by the WFP HMS between April - August 2020.

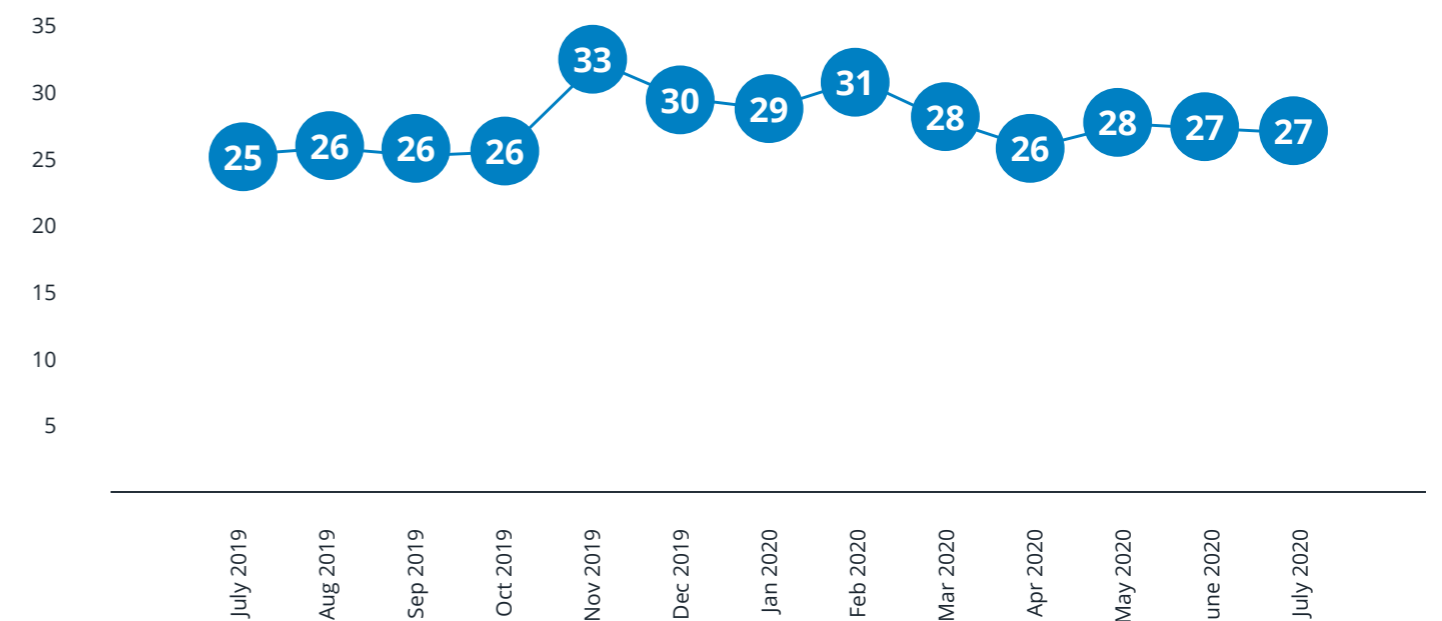


Around 13.7% of respondents, representing around 5.3 million people, reported using negative coping strategies to meet their food needs on 9 August.<sup>18</sup> WFP's HMS also revealed that around 26.6% of the population faced challenges accessing the market and grocery stores, primarily due to movement restrictions or fears of being infected. Previously in May, this figure was 36%, so conditions and physical access to food appear to be improving. Access to health services similarly improved; 26.5% of people reported challenges accessing health services, primarily because of lack of money or movement restrictions, whereas on 18 May, 33.3% reported challenges in accessing health facilities.

COVID-19 mitigation measures, such as curfews and lockdown, negatively affected employment opportunities for daily casual laborers and low-income workers, and hence their ability to earn an income. Terms of Trade (ToT) is a direct measure of food access, assessing how much of a given commodity an unskilled wage can buy. Temporal trends of ToT serve as a good proxy indicator if vulnerable people experience decreased ability to purchase food. Stable wheat flour prices helped maintain the ToT; however, additional health and hygiene expenses affected a person's ability to buy enough food for their family. The graph shows that ToT over the past three months remained relatively stable; however, it did not reach pre-COVID-19 levels (Figure 12). An unskilled day wage could buy 31kg of wheat flour before COVID-19; however, that has dropped to 27kg. The largest decreases were in Kirkuk (41%) and Salah Al Din (20%).



**Figure 12:** Terms of Trade for wheat flour, which calculates the amount of wheat an unskilled wage could buy (in kg).





# V. DIGITAL INNOVATION FOR FOOD SECURITY

Digital innovation in the agricultural sector may be the next agriculture revolution. Mobile technologies, remote sensing services and distributed computing are prevalent worldwide and can improve agriculture productivity, reduce information asymmetries and market inefficiencies, decrease transaction costs and streamline supply chains. If leveraged effectively, digital innovation can make the agri-food sector more efficient, inclusive and environmentally sustainable by collecting, analyzing and transmitting data about agri-food systems and connecting relevant stakeholders in real-time.<sup>19</sup>

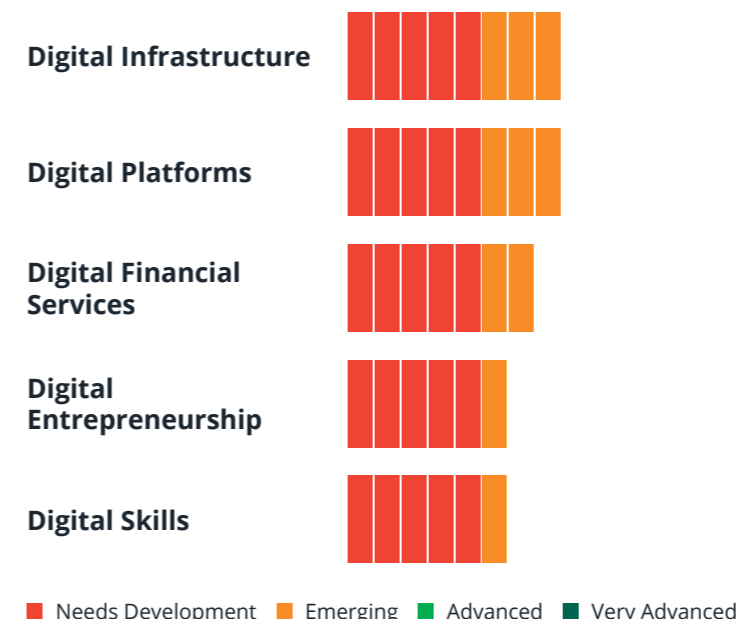
In light of COVID-19, digital solutions are more important than ever to allow governments, agencies and the private sector to adapt their operations to the “new normal”, particularly physical distancing requirements and movement restrictions. Adopting these tools now can help reduce the impact of COVID-19, and also improve resilience against future shocks. Investing in Iraq’s digital transformation will enable the country to recover faster from the pandemic, and achieve longer-term goals for the sector.

Iraq’s digital ecosystem is improving and the government has committed to investing in the sector. FAO<sup>20</sup> identifies the following conditions required for digital transformation: (i) supportive policies, available and affordable technologies and trained workforce; and (ii) enabling conditions that facilitate the adoption of technologies, such as use of internet, mobile phones and social media, digital skills and support for agripreneurial and innovation culture. Iraq has made strides in certain areas, but has been slower to catch up in others. The Iraq Vision 2030 explicitly states that digitization across the society is a priority and encourages public-private partnerships to achieve its goals. The government also publicly committed to advancing the digital economy during the 2020 forum on Digital Economy and Entrepreneurship Development in Mashreq, to ensure the population has access to affordable, high-speed internet, develop interoperable digital payment infrastructure and deliver government services via reliable digital platforms.<sup>21</sup> As security and stability improved after 2017, Iraq has been able to install new fiber optic cables, which has led to a growth in mobile broadband subscribers. In 2019, roughly 96% of Iraq’s population were subscribed to mobile phone services and 49% actively used mobile internet.<sup>22</sup> Currently, 3G networks cover 93% of Iraq’s mobile subscribers.<sup>23</sup>

Despite the government’s commitment to growing the digital economy, Iraq still lags behind other MENA countries. The World Bank’s MENA Tech Initiative reviewed the digital economy in MENA countries, evaluating each country across five pillars: digital infrastructure, digital platforms, digital financial services, digital entrepreneurship and digital skills. Iraq performed below the MENA average for all pillars. In particular, rural communities face inequalities and challenges in accessing technology and the internet in general. There is still a significant gap in extending high-speed broadband networks to Iraq’s rural population. Challenges remain omnipresent in cybersecurity and data protection, labor replacement and re-education, and the risk of creating a digital divide between sectors or even individuals with differing abilities to adopt new technologies, hampering Iraq’s ability to transform the agri-food sector.

Table 5: Digital economy performance by pillars. Source: World Bank MENA Tech Initiative.

Digital Economy Values (0-10)			
Pillars	Iraq	MENA average	MENA average excluding GCC
Digital Infrastructure	3.83	5.01	4.17
Digital Platforms	4.08	5.44	4.81
Digital Financial Service	3.47	5.34	4.39
Digital Entrepreneurship	2.95	4.18	3.55
Digital Skills	2.83	4.68	3.94



To unlock the potential of digital technologies and ensure inclusive growth, Iraq must improve the quality of digital and non-digital infrastructure, introduce enabling policies and regulations, build human capacity to use digital tools and guarantee the environmental sustainability of digital developments. Public services that improve infrastructure, including the speed of mobile and internet connectivity in rural areas, and reduce the cost for end-users may facilitate the adoption of digital technologies in the agriculture sector. Complementary investments, including in rural road construction and electrification projects, can address constraints that currently limit rural areas’ connection to markets and the power supply.

To increase the adoption of technologies, the government agricultural subsidy program could consider prioritizing payments to farmers using digital technologies in order to allocate scarce resources more efficiently, such as the adoption of smart irrigation, mobile payment systems or digital extension services. Cross-cutting issues, such as gender and age, need to be addressed to ensure that the introduction of digital tools is inclusive. According to the World Bank’s Mashreq Gender Facility’s analysis, only 72 women use the Internet compared to every 100 men, and roughly 89 women use mobile phones for every 100 men, a gender gap of 28 and 11% respectively. Adult literacy is only 43.7%, with female literacy rates well below those of men. The public sector should also adopt policies on ownership, digital privacy and data use to facilitate entrepreneurship and safeguard users.

The relevance and urgency of these actions is essential in view of the ongoing global crisis and sustainable development needs. The government strives to adopt and promote digital technologies to mitigate the impact of COVID-19 and “build back better”, improving the efficiency of public services and creating an enabling environment to digitalize the agri-food sector. Recommendations to facilitate broader adoption of digital technologies and harness their impacts on the agri-food value chain are highlighted below, along with examples from Iraq, the region and around the world.

## A. FARM PRODUCTION

**Providing incentives to adopt precision agriculture technologies to help increase productivity, tackle water scarcity and inefficient resource management.** Digital technologies can improve natural resource use efficiency such as smart irrigation systems with optimized fertigation<sup>24</sup>, robots, remote sensing (satellite and drones), sensors, robotic milking and feeding systems. Effective management of natural resources will be particularly important given the cascading impact of climate change. For example, precision agriculture improves the quantity and quality of agricultural output while using less water, energy, fertilizers and pesticides. This improves farmers’ climate change resilience, whilst reducing the ecological footprint. For example, in India, 400,000 farmers use a mobile phone application called Nano Ganesh to control their irrigation pumps, thus saving water, energy and time.<sup>25</sup>

**Introducing digital financial tools and enabling public policies to foster financial inclusion, particularly among rural populations and farmers.** Digital financial technologies can help rural farmers join the formal financial sector, also increasing their access to forms of credit and loans that would otherwise be inaccessible to “unbanked” individuals. Digital finance also reduces transaction cost and promotes the adoption of smart contracts, a risk mitigation tool that is flexible, low-cost, secure, and customizable to a multitude of risks and pay-outs (large and small), with marginal transaction costs. A number of digital risk mitigation tools exist, with stellar examples stemming from east Africa such as [AcreAfrica](#), [Arifu](#), [Cellulant](#), [Juhidi Kilimo](#).

Such digital efforts work well alongside other initiatives to invest in modern technologies, such as drip irrigation and more effective water management systems - all helping agricultural production and rural livelihoods, which are further exacerbated by climate change.





Digital finance can be promoted by creating enabling policies for digital payments and establishing an interoperable digital payments system. In addition, it is necessary to facilitate linkages between telecom companies promoting e-payments with online credit providers. An appropriate consumer protection framework, reliable digital networks, and banking and telecoms policies that support digital financial services are all important components for developing a functional digital payments system.

In Iraq, WFP is working with food shops in camps for displaced and refugee families, to accept new “cashless” payments by mobile phone. WFP had long planned to trial cashless transactions, leveraging existing solutions developed by mobile money providers, and COVID-19 was the catalyst to fast-track the pilot. Apple Pay, Android Pay and M-PESA are examples of digital, cashless solutions that increase financial inclusion. Kenya’s M-PESA is a mobile phone payment system introduced in 2007 that reached 65% of Kenyan households by 2009, and lifted an estimated 2% of rural Kenyan households out of poverty. Similarly, WFP’s cashless transactions reduce the handling of physical banknotes, avoid unnecessary movements and increase the options of how people can purchase food, with the aim to reduce the risk of COVID-19 exposure, while also increasing financial inclusion for displaced people and refugees.

**Transferring agricultural knowledge through e-extension services, providing cost-effective ways to reach a greater number of farmers and help prevent the spread of disease.** E-extension provides targeted and real-time access to information on how farmers can resolve both general and highly specific problems ranging from sustainable farming practices and climate smart solutions to market access. Traditional, face-to-face agriculture extension services are effective, however requires significant staff resources and institutional support. In Iraq, the extension service system has been undermined by years of conflict and underfunding and, although extension officers are employed across the country, their numbers are insufficient for connecting with all farmers. COVID-19 has also limited the ability of extension officers to reach farmers and provide crucial information in a timely manner, both due to social distancing recommendations and government enforced movement restrictions. Thus, digital solutions can fill the gap and provide farmers with immediate access to information, improving productivity and incomes. Meta-analyses suggest that the transmission of agricultural information through mobile technologies can increase yields by 4% and the adoption of recommended agrochemical inputs by 22%.<sup>26</sup>

There are numerous examples of effective digital extension service platforms. In East Africa, WeFarm has more than two million small-scale farmers participating in a farmer-to-farmer information exchange platform that also connects them with retailers and brands to grow their business (<https://wefarm.co/>). In India, Plantix is a WhatsApp based application that uses artificial intelligence and machine learning to help farmers diagnose pests, diseases and nutrient deficiencies in 18 different languages. Beyond the private and development sector, a number of governments are also introducing digital services to their portfolios. In collaboration with the Government of Egypt, FAO is piloting an extension service digital platform focused on citrus, date palm and poultry production systems, in addition to a component on human nutrition. In Iraq, the MoA has similarly begun investing and piloting digital extension applications, and FAO Iraq recently received funding to support and upscale the initiative.

## B. AGRO-PROCESSING

**Enhancing food traceability to improve agri-food sector exports and food safety standards.** Blockchain and other distributed ledger technologies (DLTs) can be leveraged to enhance food safety and traceability. DLT is a decentralized database that is consensually shared and synchronized across all users, allowing the database to be simultaneously accessed, validated and updated across multiple entities and geographic locations. Blockchain is one example of DLT and has multiple applications within the agriculture sector, such as increasing the adoption of low cost insurance schemes, improving land ownership registrations and streamlining agricultural supply chain management.<sup>27</sup> Blockchain has already been introduced to improve product traceability. Carrefour, a supermarket chain in France, uses blockchain to provide consumers with detailed information on purchased chicken, such as veterinary treatments, freshness, and other metrics. Similarly, Uruguay has successfully developed a digital tracing system for the livestock sector to improve food safety, animal health and product certification. The National Agricultural Information System integrates dispersed agriculture, natural resource management, and new climate-related information from 32 national agencies in an online, state-of-the-art platform tailored to the needs of different users.



WFP’s “SCOPE” platform supports data management for cash-based transfers and other assistance provided to displaced, refugee, returnee families and host communities. NGO and UN partners have approached WFP to request use of the same platform, thus avoiding duplication of work and streamlining approaches to data management for people assisted. WFP continues to build the capacity of partners and stakeholders to use SCOPE in their own projects and best meet people’s needs. The platform has proven to be agile, robust and adaptable, as evidenced in its use during the COVID-19 pandemic.



### C. TRANSPORT, TRADE & RETAILERS

**Promoting e-commerce and digital marketplaces to avoid disruptions in value chains due to exogenous shocks, including COVID-19, and increase income in rural areas.** E-commerce can directly link producers to consumers, eliminate market intermediaries, improve price transparency and offer new business opportunities for small agricultural producers and small and medium-sized enterprises. During the pandemic, a Chinese e-commerce platform run by Pinduoduo Inc. created a dedicated sales channel on its app for farmers when wholesale markets shut down due to COVID-19. In Kenya, [Twiga Foods](#) is bridging the gap between farmers and vendors. A mobile-based, business-to-business digital commerce platform, Twiga Foods matches small-scale supply and demand for fruits and vegetables and cuts out layers of middlemen, eliminating waste and reducing food prices for mass market end-consumers.

### D. CONSUMPTION

**Introducing digital innovation in public services and operations to increase efficiency, improve transparency and reduce costs.** The public sector can digitize services, including subsidy distributions, extension services and rural cadasters. For example, 99% of Estonia's public services are online, increasing the government's efficiency and farmers' access to services.<sup>28</sup> Digital services have also reduced physical contact among essential workers, reducing the risk of COVID-19 transmission. The public sector in Iraq can deploy remote sensing technologies for improved land-use monitoring and early warning systems (e.g. pests and weather), and share that information using a digital farmer registry that can help the government target support and tailor knowledge transfers.

WFP and the Iraqi government are jointly working to reform the country's largest social safety net: the Public Distribution System (PDS) of food rations. WFP designed and launched a mobile smartphone app called 'Tamwini' ('My Food Ration') in early July, enabling citizens to conveniently update the family information, which determines food entitlements, and make digital payments for those entitlements. Tamwini will also link to the new digital national ID (unified ID); MoT and MoI have met to define requirements for integration to enable the PDS to verify identity against the national unified ID system. Currently, around three million households have an unified ID, and that number will grow to cover the entire population in the near future. Beyond the app, a new ePDS biometric registration process was introduced mid-2020, reaching almost 53,000 people. Registered households have scanned their irises, providing a form of secure, biometric identification. Across the country, 20 PDS branches and 24 food agents have the equipment required to operate the digitalised "ePDS," where registered individuals can scan their irises and receive their food basket. Although COVID-19 movement restrictions have significantly slowed down biometric registration and ePDS adoption, Tamwini and ePDS are critical components to reform Iraq's social protection services. WFP has engaged experts the Estonia eGovernance Academy (eGA) to develop the ePDS "roadmap and blueprint" for next steps in the reform and digital transformation, in collaboration with key government stakeholders at MoT and other government ministries and departments, to be able to roll out the ePDS to all citizens in the country.



**Developing secure platforms to support people assisted by social protection schemes.** Secure data exchange platforms are required to ensure people's right to confidentiality, while improving targeting for the most vulnerable, streamlining complaints and feedback mechanisms and providing real-time snapshots of progress. WFP has generated "At a Glance" dashboards that display real-time data to help staff make informed decisions. Both crisis response activities and regular programming benefit from rapid data analysis and visualization, allowing issues to be identified and resolved quickly, and providing the solid basis required for policy makers to make prudent decisions.

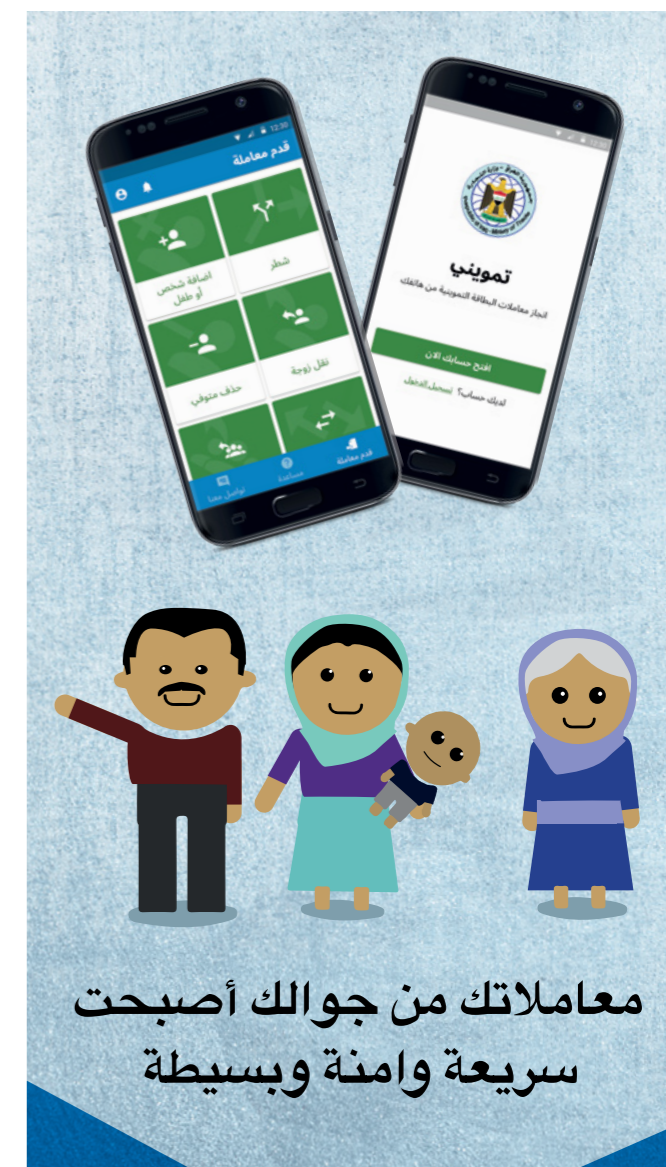
### E. ACROSS THE VALUE CHAIN

**Promoting open data and fostering digital entrepreneurship.** Open data can increase transparency in the food system and provide essential data for agriculture start-ups, such as national digital land use and soil maps, real-time agricultural weather forecasts, farmer demographics and market data. In Lebanon, the Open-Access Geospatial Portal Database allows users to create and download thematic maps providing information on soils, land use and land cover, watersheds, and disaster events. The public sector can also support digital entrepreneurship through the development of incubator and accelerator services targeting start-ups and private-sector innovators in the agri-food sector. Agri-food start-ups can develop new digital innovations or customize existing successful digital applications with support from accelerators, such as the Agrytech and Hassad accelerator in Lebanon and Jordan respectively. For financing, the public sector can explore blended finance modalities to reduce risk and accelerate technological adoption.<sup>29</sup>

FAO is leveraging available geospatial data to improve agriculture policies and production. The organization recently launched a Geospatial Platform to support the operationalization of the [Hand-in-Hand Initiative \(HiH\)](#). HiH aims to introduce evidence-based, country-led and -owned programming to accelerate agricultural transformation and sustainable rural development in an effort to eradicate poverty, and end hunger and malnutrition. Geospatial data has been sourced from across the agency's divisions, in addition to sister UN agencies, NGOs, private sector companies and space agencies; as of now, FAO has assembled a million spatial layers. Leveraging "big data" is critical for identifying and monitoring agriculture production and natural resource management, including water, rangeland and forest management. Such data can also be used to proactively monitor climate change and land cover changes, improving the ability of governments and partners to protect ecosystems and respond to disasters. By housing all information in a central repository, users should be able to more easily extract and analyze the data required to make evidence-based decisions.

**Leveraging digital technologies to tackle food loss and waste.** Food loss and waste (FLW) is the decrease in food along the food supply chain, which was initially intended for human consumption. Food loss occurs upstream of the value chain when a food is harvested, stored or transported, while food waste occurs downstream of the supply chain, at the retail and consumer level. FAO estimates that around 30% of all food is lost or wasted annually, resulting in losses of up to USD 400 billion a year. In the MENA region, FAO calculated that 11% of all food is lost or wasted<sup>30</sup>, with 68% of losses occurring at the early stages of the supply chain, and 32% wasted at the consumer level.<sup>31</sup> FLW has serious implications for the environment, economy and society and, can be addressed through digital technologies.

In the MENA region, private sector companies have stepped in to introduce technologies to tackle the dual issues of food loss and food waste. Danfoss introduced digital technology in KSA, Jordan and the UAE to monitor the temperature of cold storage, improving the shelf life of perishable items. Wasteless, a company based in Israel and the Netherlands, has developed innovative, dynamic pricing technology using machine learning in order to help retailers cut waste and increase their revenues. Electronic shelf labels automatically discount the price of food as their expiration date nears, and connect to stores' point-of-sales systems. At the consumer level, a company called FoodKarma has launched an app in the UAE to offer users the chance to purchase food that would be otherwise be thrown away from partner restaurants, cafes and vendors.







## ACRONYMS

<b>BeneMark</b>	Beneficiary Market Perspectives Survey
<b>CBT</b>	Cash-based transfers
<b>CCI</b>	Cash Consortium of Iraq
<b>FAO</b>	Food and Agriculture Organization
<b>FCS</b>	Food Consumption Score
<b>FPI</b>	Food Price Index
<b>GDP</b>	Gross Domestic Product
<b>HiH</b>	Hand in Hand Initiative
<b>HMS</b>	Hunger Monitoring System
<b>IDP</b>	Internally Displaced People
<b>IFAD</b>	International Fund for Agricultural Development
<b>IOM</b>	International Organization for Migration
<b>IQD</b>	Iraqi Dinar
<b>ISIL</b>	Islamic State of Iraq and the Levant
<b>ITC</b>	International Trade Centre
<b>KI</b>	Key informant
<b>KRG</b>	Kurdistan Region Government
<b>KR</b>	Kurdistan Region
<b>MENA</b>	Middle East and North Africa
<b>mMFI</b>	Mobile Market Functionality Index
<b>MoA</b>	Ministry of Agriculture
<b>MoI</b>	Ministry of Interior
<b>MoLSA</b>	Ministry of Labor and Social Affairs
<b>MoMD</b>	Ministry of Migration and Displacement
<b>MoP</b>	Ministry of Planning
<b>MoT</b>	Ministry of Trade
<b>MoWR</b>	Ministry of Water Resources
<b>m/m</b>	Month on month
<b>mVAM</b>	Mobile Vulnerability Analysis and Mapping
<b>NAP</b>	National Agricultural Plan
<b>PDS</b>	Public Distribution System (of food rations)
<b>rCSI</b>	Reduced Coping Strategy Index (food based)
<b>SCHNS</b>	Supreme Committee for Health and National Safety
<b>SMEs</b>	Small and Medium Enterprises
<b>SMEB</b>	Survival Minimum Expenditure Basket
<b>ToT</b>	Terms of trade
<b>USD</b>	United States dollar
<b>WASH</b>	Water, Sanitation and Hygiene
<b>WFP</b>	United Nations World Food Programme
<b>WHO</b>	World Health Organization
<b>y/y</b>	year on year



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