

The development of the indicators and axes of Arab food security during 2015-2022 and the main sustainability strategies and policies in the Arab states

BISSAR Abdelhakim^{1 *}

¹ University of M'sila (Algeria) , Laboratory of Strategies and Economic Policies in Algeria, abdelhakim.bissar@univ-msila.dz

Received: 18/11/2024

Accepted: 10/12/2024

Published: 22/12/2024

Abstract:

This study seeks to examine the state of food security in Arab countries from 2015 to 2022, as well as to identify the key strategies and programs aimed at ensuring the sustainability of food security in light of recent challenges and fluctuations. The findings indicate that food security levels in the Arab region are significantly lower than international standards, according to various indicators used by Arab organizations. Additionally, the food gap remains high for most essential food items. Achieving food security and moving beyond self-sufficiency will require increased efforts from individual nations and the Arab world as a whole.

Keywords: food security; the food security indicators; the Arab states; policies and strategies.

JEL Classification: O13; Q18; Q17.

Introduction :

Food security is now a fundamental aspect of development plans and research globally. It is a critical issue that undermines development efforts and contributes to increased poverty and hunger. In this context, various international and regional organizations, including the Food and Agriculture Organization (FAO) and the Arab Organization for Agricultural Development, have explored methods to enhance food production and achieve food security at both the international and Arab levels.

Achieving these goals largely depends on promoting agricultural development and boosting the production of both animal and plant crops. Consequently, food security serves as a cornerstone for rural and agricultural development worldwide.

The Arab states have established strategic plans and programs aimed at enhancing food security and its sustainability, tailored to the economic framework of each nation—whether it be a guided economy, a free market economy, or a publicly dominated economy. These strategies encompass the management of natural resources, such as land and water, the development of production capabilities, increased agricultural investment, and the formulation of lending and funding policies focused on small farmers and rural development initiatives.

Moreover, Arab states have promoted cooperation through unified policies, strategies, and plans to achieve the developmental goals outlined in the UN Sustainable Development Program, where food security is a central focus. Despite the implementation of these strategies by various organizations and entities, the desired objectives remain elusive, as food security levels in the Arab region continue to fluctuate, particularly in light of recent international challenges.

Problematic of the study:

Based on what was said, and to analyze the late indicators and situations of food security in the Arab world and shed light on the main strategies and efforts adopted by the Arab organizations that seek general development, and the agricultural in particular, we find ourselves obliged to grapple with a paramount question that can be raised as follows, “What are the main developments in the indicators and situations of Arab food security during 2015-2022? And what are the main adopted sustainability policies and strategies?”

Importance of the study:

The importance of the study lies within the nature of the topic, which shall focus on the indicators and situations of Arab food security during 2015-2022 and discuss the main policies and strategies of the

common efforts by the Arab states to reach food security and sustainability. In this regard, we shall rely on the reports and studies of the specialized Arab organizations, such as the Arab Organization for Agricultural Development, and the Arab Monetary Fund.

Aims of the study:

This study aims at:

- Knowing the main concepts and theoretical aspects of food security.
- Analyzing the indicators and situations of Arab food security during 2015-2022 based on the axes adopted by the Arab Organization for Agricultural Development.
- Identifying the main policies and strategies adopted by the Arab organizations in the light of their common efforts to increase the agricultural development and foster food security and sustainability.

Structure of the study:

To answer the study problematic and reach the objectives, we divided the study into three main axes, as follows:

1. The conceptual framework of food security.
2. The development of the main indicators and axes of the Arab food security during 2015-2022.
3. The Arab programs and strategies for the sustainability of food security.

1- The conceptual framework of food security:

Food security is one of the essential human needs for maintaining physiological balance and optimal work performance, encompassing various aspects and concepts. The challenge of securing sufficient food has been a concern throughout human history, prompting nations to make significant efforts to ensure stable food supplies. However, developing countries continue to struggle with food adequacy.

The relationship between population growth and production growth is crucial in determining economic development. Economic progress can be viewed as a race between increasing productivity and population. When population growth exceeds production capabilities, GDP per capita declines. Conversely, economic growth is achieved when production outpaces population growth. These dynamics underscore the importance of enhancing agricultural productivity and food security as key components of sustainable development. (Houchine, 2006-2007, p. 253)

1-1- Definition of the food security:

Since the 1970s, the concept of food security has become increasingly significant in emerging nations, which have experienced a substantial decline in food production and reserves. This decline has heightened their dependence on wealthier countries for food security. Malnutrition in these countries, coupled with the growing emphasis on food security, has prompted international organizations and policymakers in developing nations to pursue effective solutions. According to data from the FAO's annual conference in Rome in 1995, nearly 1.3 billion people worldwide are affected by malnutrition. Furthermore, approximately 199 million children under the age of five are affected by a severe chronic deficiency of energy and protein. Estimates from the FAO indicate that more than 730 million people are expected to continue living in poverty. (Al Cirti, 2000, p. 8)

The international community has defined food security on multiple occasions, and the concept has evolved considerably over time. Originally, food security was seen as a basic idea focused on the consistent supply of food. Now, it is understood as part of a complex social framework that influences living standards. The state of food security is shaped by this social context and the balance of various forces at play. (Carr., 2006, p. 1). Additionally, food security is described as the ability of individuals to consistently access sufficient nutrition to support their activities and overall well-being. (Salem Toufik, 2009, p. 53). This definition is influenced by several factors, including food productivity levels, the availability of supporting resources, and the institutional frameworks that bolster agricultural production. These elements empower societal groups to secure adequate food in both regular circumstances and during emergencies, such as droughts, economic shocks, or periods of economic growth.

Moreover, international food security may involve achieving food self-sufficiency, allowing a state or nation to fulfill its nutritional needs without relying on assistance or imports from other countries. (Assaf & al Wadi, 2011, p. 127). Similar to the initiatives in the Arab world and the efforts of the Arab Organization for Agricultural Development, which aim to develop plans to expand agricultural production and achieve food security, this definition emphasizes the potential for cooperation among states in formulating national agricultural policies that ensure the fulfillment of food needs.

Furthermore, various international organizations have defined food security as an ongoing process that involves producing sufficient food to feed the global population, distributing that food to meet demand across

states and regions, and establishing international reserves to address gaps caused by food-related natural disasters. Among the key definitions provided by these organizations, we find that: (Zaoui, 2015-2016, pp. 67-68)

- The FAO defines food security as being achieved when all individuals have the material, social, and economic opportunities at all times to access sufficient, safe, and nutritious food that meets their dietary needs and supports an active and healthy life.

- The Arab Organization for Agricultural Development asserts that food security in the Arab world can be achieved when food is accessible to people without barriers. This security depends on various factors influencing food production and trade, as well as the ability to obtain food. Key factors include natural resources, technological advancements, and economic performance.

1-2- The dimensions of food security:

Food security has four dimensions, according to the FAO definition (2008). These can be summarized as follows (Peng & berry, 2019, p. 2):

1-2-1- The availability:

This includes both locally produced food and imported food.

1-2-2- The access

Food reaches consumers through transportation infrastructure, which requires that consumers have sufficient funds to purchase it. In addition to material and economic means of access, sociocultural factors play a crucial role in ensuring that food is culturally acceptable. Furthermore, social protection systems are essential for helping marginalized individuals gain access to food.

1-2-3- The utilization:

Individuals must have access to an adequate quantity and quality of food to maintain a healthy life and meet their nutritional needs. Additionally, food and water must be safe and clean, making a reliable water supply and sanitation system essential. Moreover, good physical health is necessary for individuals to effectively digest and utilize the food they consume.

1-2-4- The stability:

It pertains to the ability of a nation, community, or family to withstand shocks to the nutritional system, whether these arise from natural disasters (such as climate events or earthquakes) or human-made crises (such as wars or economic downturns). Consequently, food security operates on multiple levels:

- **National Availability:** The overall supply of food within a country.
- **Family Access:** The ability of families to obtain sufficient food resources.
- **Individual Utilization:** The capacity of individuals to effectively consume and benefit from the food they access.
- **Stability:** A temporal dimension that impacts all levels, ensuring that food security is maintained over time.

All four dimensions must be secure to achieve comprehensive food security.

In this context, the developments highlight the significance of sustainability, which can be regarded as the fifth dimension of food security. Sustainability encompasses regional indicators such as environmental health, biodiversity, and climate change, along with social, cultural, and economic factors that influence the food security of future generations.

1-3- The main causes of food insecurity:

Understanding the causes of food insecurity and their potential effects on individuals is a crucial first step in mitigating its impacts. The following points outline the primary causes of food insecurity: (Austin, 2021)

- **Conflict:** It is the leading factor contributing to international famine, with over 60% of individuals experiencing food insecurity living in conflict-affected areas. In these regions, people are often forced to flee their homes, abandoning their jobs and farmland. Additionally, conflict fractures societies and compels farmers to adopt short-term strategies, driven by the fear of future uncertainties, particularly the possibility of having to leave their lands.

- **Climate Change:** Following the recession years, hunger levels increased significantly between 2015 and 2018, affecting approximately 40 million people. In this context, African states in the Sahel region have been particularly hard hit, experiencing the devastation of entire areas, crops, and food supplies due to natural disasters linked to climate change.

-**Demographic Growth:** According to the UN, the global population is projected to reach 10 billion by 2050. This increase necessitates a corresponding rise in food availability and access. Unfortunately, some countries experiencing high population growth may face a decline in essential resources for food production, such as water supplies and arable land

2- The development of the main indicators and axes of Arab food security during 2015-2022.

Measuring food security indicators varies from one country to another. In this context, several factors are centered on food availability, whether from local production or imports, as well as on food access indicators. Secondary indicators include income levels, GDP per capita, and agricultural production. Additionally, there is a focus on utilization indicators, along with relevant secondary indicators such as the amount of available food, the food gap, and levels of self-sufficiency.

We will analyze the state of food security in the Arab world from 2015 to 2022, highlighting the aforementioned indicators and dimensions utilized by Arab organizations specializing in social and agricultural development.

2-1- The food availability in the Arab world:

This is a crucial factor that reflects a country's capacity to provide its population with essential food items, whether through local production or imports. In this context, the primary goods produced in the Arab world include fish, vegetables, fruits, and animal products. In contrast, cereals, sugar, and vegetable oils are largely imported. (The Arab organization for agricultural development, 2021, p. 14).

2-1-1- Development of the Food Availability Indicator in the Arab World (2015-2020)

2-1-1-1- The planted surface:

It is one of the key indicators measuring the ability to provide food through Arab production. **Table 01** illustrates the areas dedicated to the main crops in the Arab world from 2015 to 2022:

Table 01: The surfaces of the main crops in the Arab world during 2015-2022 (1000 hectares)

Year/ crop	2015	2016	2017	2018	2019	2020	2021	2022
Cereals	32952	32663	31982	33367	30551	29301	26749	27683
Wheat	10154	9348	10278	9839	10972	10921	10079	10605
Rice	634	692	703	524	1048	763	688	784
Barley	5010	4742	5549	4980	5528	5995	3808	4292
Maize	1508	1683	1370	1608	1448	1896	1460	1363
Sorghum	15645	16009	13880	16249	11393	9775	10712	10639
Tubers	700	610	626	641	641	741	808	819
Legumes	/	1437	1436	1434	1436	2061	1569	1834
Oil seeds and olive	7729	9505	9369	11817	13004	15300	13637	14200

Vegetables	3151	2879	2816	2780	2034	2465	2040	1961
Fruits	4171	4063	4686	5281	3709.9	3240	3673	3634
Fibers	276	225	202	186	401.9	/	/	/
Sugary crops	536	543	536	534	516	551	460	484
Sugar canes	233	236	243	248	229.8	223	217	215
Beet	303	306	294	285	286	328	242	268

Source: The Arab Organization for Agricultural Development, report on the Arab food security situations, different issues.

The table indicates that the area devoted to cereals dominates agricultural land in the Arab world, accounting for 50 to 60% of total crop surfaces. This is followed by oilseeds and olives, which comprise about 25%, while fruits and vegetables together represent around 10%. The remaining crops, including fibers and sugary crops, make up about 5 to 6% of the total area.

In this context, there has been a relative increase in the planted surface across the Arab world from 2015 to 2022, although some fluctuations were observed in the later years and with certain crops. This trend suggests ongoing efforts to enhance agricultural productivity, despite challenges that may arise in specific sectors.

2-1-1-2- The development of the main foods production:

Regarding production and its contribution to food availability in the Arab world, there have been notable developments and changes from 2015 to 2022, as illustrated in **Table 02**

Table 02: The development of foods production in the Arab world during 2015-2022 (million tons)

Year/ crop	2015	2016	2017	2018	2019	2020	2021	2022
Cereals	58.38	49.63	55.09	54.11	54.73	53.98	54.46	49.49
Tubers	17.46	14.92	15.34	16.62	17.09	17.05	18.09	18.58
Raw sugar	3.48	3.64	3.66	3.86	3.79	3.83	3.52	3.27
Legumes	1.57	1.23	1.49	1.72	1.61	1.63	1.93	1.85
Vegetal oils	2.40	1.55	3.08	2.45	2.52	2.60	4.07	/
Vegetables	58.19	53.86	50.43	57.56	56.25	56.77	52.05	48.88
Fruits	37.30	35.91	35.13	36.66	39.83	40.49	47.88	44.22
Fish	4.72	5.20	4.70	4.99	5.21	5.39	6.22	6.18
Eggs	2.15	2.15	2.33	2.29	2.42	2.52	2.47	2.29
Milk	27.25	27.80	27.42	26.01	27.24	27.41	27.28	27.35
Red meat	4.45	4.65	4.36	4.21	4.13	4.10	4.35	4.23
Chicken meat	4.23	4.26	4.64	4.66	4.87	4.97	5.08	5.17

Cereals are the primary food products in the Arab world, representing the largest share of agricultural land and playing a crucial role in the overall food supply. In 2022, total cereal production in the Arab region reached 49.5 million tons, which reflects a 9.1% decrease compared to 2021 and a 9.9% decline from the average cereal production between 2016 and 2021. This decline highlights the challenges faced in maintaining cereal production levels, which are vital for food security in the region. (The Arab organization for agricultural development 2. , 2022, p. 14). Wheat is the primary cereal in the Arab world, accounting for 30% of the total cereal production due to its significant role in the region's consumption culture. Its importance is reflected in various traditional diets and staple foods, making it essential for food security and nutrition in the Arab population.

Additionally, other vegetable products experienced relative stability in production, with increases in certain years; however, they have not yet achieved self-sufficiency, particularly in raw sugar, legumes, and vegetable oils. Fruits and vegetables serve as important nutritional sources in the Arab world, with significant local production and even exports.

Regarding animal and fish production, which provide essential protein for Arab citizens, there has been stability from 2015 to 2022. This sector has contributed to self-sufficiency and even surplus in many Arab states, highlighting its importance in the region's food security strategy.

2-1-2- The food availability from the external trade during 2015-2020:

Foreign trade is crucial in complementing food production and security in the Arab world. In this context, countries import what they cannot produce domestically and export any surplus. However, between 2020 and 2022, food supply from foreign trade was significantly affected by fluctuations resulting from measures taken by major food producers in response to COVID-19 and the ongoing war in Ukraine. These disruptions have highlighted the vulnerabilities in the region's food supply chains and the importance of diversifying sources and enhancing local production capabilities. (The Arab organization for agricultural development 2. , 2022, p. 22)

Table 03 indicates a significant increase in agricultural imports compared to exports in the Arab world from 2015 to 2022. This trend underscores the continuing need for enhanced agricultural production efforts to meet food needs and reduce dependency on imports for cereals, raw sugar, legumes, and vegetable oils.

Additionally, there was a decline in the value of both food imports and exports during 2020-2021, largely due to the negative impact of the health crisis on international trade. Although there was a slight increase in agricultural exports of 0.6% between 2020 and 2021, this was accompanied by a notable decrease in the main food exports and interregional food exports, with reductions of 9.26% and 33.38%, respectively.

In 2022, the value of the main food exports rose by 6.33%, reaching 19.78 billion USD compared to 18.61 billion USD in 2021. Meanwhile, the value of main food imports also increased by 6.99% between 2021 and 2022. However, the overall value of exports managed to cover the value of food imports during this period, decreasing from 27.6% to 26.4%. This situation highlights the ongoing challenges and dynamics in the agricultural trade landscape within the Arab world.

Additionally, the table reveals that interregional food exports constitute a significant share of the overall main food exports, despite experiencing a substantial decline of 33.4% between 2020 and 2021. In this context, the rate of interregional food imports remained very low during the period from 2015 to 2022, with a notable decrease of 29.1% between 2020 and 2021. This suggests that while there is potential for increased trade within the region, various factors have hindered growth in interregional food import activities.

Table 03: The value of the overall and agricultural exports and imports in the Arab world during 2015-2022 (billion USD)

Year/ statement	2015	2016	2017	2018	2019	2020	2021	2022	The rate of change between 2021 and 2022
Overall exports	890.3	737. 5	907. 8	896	1009 6.	837. 64	945. 34	1382. 88	46.28
Agricultur al exports	39.6	36.1	42.5	32.8	50.3 5	50.5 7	50.8 6	62.28	5.86 -
Main food exports	28.6	26.8	27.5	30.7	22.8	20.6 7	18.6 0	19.78	6.33
interregio	16.1	14.3	14.1	10.1	9.55	15.6 7	10.4 4	/	/

nal food exports									
Overall imports	827.9	752.3	797.8	675.3	838.4	769.02	729.85	834.18	13.54 -
Agricultural imports	118.5	113.6	121.0	98.3	123.23	122.20	116.39	132.94	14.22
Main food imports	103.2	96.3	98.1	69.1	67.00	67.55	67.18	71.97	6.99
Interregional food imports	17.2	17.7	16.6	10.5	15.41	15.17	10.75	/	/

Source: The Arab Organization for Agricultural Development (2022), report on the Arab food security situations, Khartoum, p. 25.

2-1-3 The food availability from food donations and aids:

Some Arab states have faced conditions that adversely affected their food security, leading other countries and organizations to provide food aid. Aid programs have specifically targeted nations such as Yemen, Palestine, and Sudan, offering both in-kind assistance and development initiatives aimed at improving the conditions of small farmers in the region.

On an international scale, the World Food Program (WFP) also provides support to countries experiencing food crises, including several Arab states. Notably, the value of aid to certain Arab countries increased significantly, rising from \$14.765 billion in 2014 to \$23.748 billion in 2018. This surge underscores the urgent need for assistance in addressing food security challenges in the region.. (The Arab organization for agricultural development, 2021, p. 21).

2-1-4 The food availability index:

The food availability index evaluates the adequacy of national food supplies, the risk of supply disruptions, the country's ability to distribute food, and efforts to enhance food and agricultural production. This index is assessed based on several key factors, including:

- **Food Supply Sufficiency:** The overall adequacy of food available to meet the population's needs.
- **Public Expenditure on Agricultural Research and Development:** Investments aimed at improving agricultural productivity and sustainability.

- **Agricultural Infrastructure:** The quality and accessibility of infrastructure supporting food production and distribution.
- **Fluctuations in Agricultural Production:** Variability in crop yields and agricultural outputs.
- **Political Instability Risks:** The impact of political instability on food supply and distribution networks.

In 2022, the food availability index for the Arab world, representing 14 countries, was recorded at 55.6, which is below the international average of 57.6. **Table 04** illustrates the decline in this index from 2020 to 2021, highlighting trends both internationally and within the Arab region. (The Arab organization for agricultural development, 2021, p. 30)

Table 04: The food security indicators at the Arab and international levels during 2019-2021 (degrees from 0 to 100)

Year/ index	Arab region			The world		
	2019	2020	2021	2019	2020	2021
General index	61.4	60.4	60.6	60.9	59.4	60.9
Food availability	56.5	55.8	54.6	56.7	57.3	56.7
Food access	67.6	66.9	67.9	66.8	65.9	66.8
Food safety and security	68.0	69.5	68.0	68.0	67.6	68.0
The natural resources and the ability to resist	50.9	42.1	48.7	50.8	49.1	50.8

Source: The Arab Organization for Agricultural Development, report on the Arab food security situations, Khartoum, p. 31.

2-2 The food access index:

This index is determined by individuals' ability to meet their food needs, which is influenced by their financial resources (income), food product prices, demographic growth, advancements in food production, and prevailing dietary patterns. Several factors impact the demand for food products, including:

- **Income Levels:** Higher income generally leads to increased purchasing power for food.
- **Population Size:** A larger population increases overall food demand.

- **Food Prices:** Fluctuations in food prices can affect how much food individuals can afford.
- **Prices of Alternative Products:** The availability and pricing of substitute goods can also influence food demand.

Together, these factors shape the overall food consumption patterns and accessibility within a population. (the Arab Organization for Agricultural Development, 2017, p. 68).

This index reflects consumers' ability to purchase food, their vulnerability to price shocks, and the availability of programs and policies that support them during crises. It is measured using six sub-indicators:

- **Household Expenditure on Food:** The proportion of income spent on food by households.
- **Percentage of People Living Below or Near the Poverty Line:** This indicates the economic challenges faced by a portion of the population.
- **GDP per Capita:** A measure of economic performance that impacts overall purchasing power.
- **Customs Tariffs on Agricultural Imports:** Tariffs can affect food prices and availability.
- **Food Security Nets:** Programs designed to assist vulnerable populations in accessing food.
- **Farmers' Access to Financing:** Financial support for farmers can enhance production and food availability.

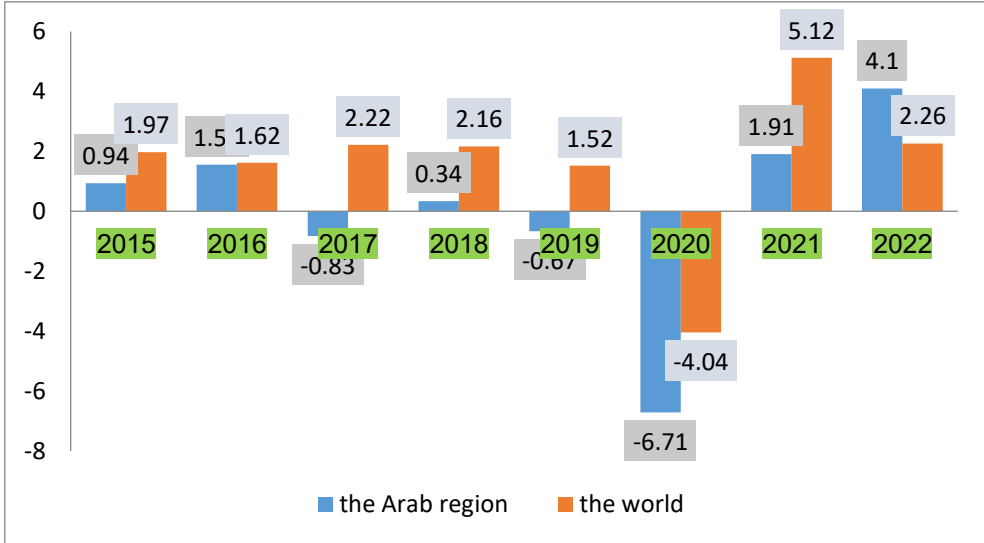
In this context, **Table 04** indicates that the average value of the access index in the Arab world surpassed the global average in 2021. Specifically, the index ranged from 89 to 79 in Oman, Kuwait, Bahrain, Qatar, and Saudi Arabia. In contrast, it ranged from 78 to 66 in Algeria, Jordan, Morocco, the UAE, Tunisia, and Egypt, while Syria, Yemen, and Sudan had a lower range of 39.3 to 32. This variation highlights differences in food access across the region. (The Arab organization for agricultural development, 2021, p. 32)

Income levels are a crucial factor influencing both the quantity and types of food available to consumers. According to World Bank statistics in 2022, the annual growth rate of individual income in the Arab world was negative between 2019 and 2020. However, it rebounded with an increase of 1.9% in 2021 and 4.1% in 2022, surpassing the international average, as illustrated in **Figure 01** below.

These fluctuations were directly linked to various factors affecting economic activity and trade, including improvements in oil and gas prices in

the Arab region between 2021 and 2022. This correlation emphasizes the impact of global commodity prices on local economies and food access.

Figure 01: The average annual growth of the average income per capita in the Arab region and in the world (%)



Source: By the author based on the Arab Organization for Agricultural Development (2022), the Arab food security situations 2022, p. 28.

GDP per capita is a significant factor influencing food access, quantity, and quality. The index has shown variance between the Arab and international levels, with the Arab index valued at 7,630 USD, compared to the international value of 12,442 USD.

Between 2018 and 2022, the Arab index values were consistently lower, being approximately 5,000 USD below the international average. Notably, the index reached its peak in 2020, estimated at 5,750 USD, largely due to the effects of the global economic recession triggered by COVID-19.

The rate of change in GDP per capita between 2021 and 2022 was significant, increasing by 21%, from 6,280 USD in 2021 to 7,630 USD in 2022, as illustrated in **Table 05**. This increase highlights a recovery in economic conditions that can positively impact food access in the region.

Table 05: The GDP per capita (1000 USD)

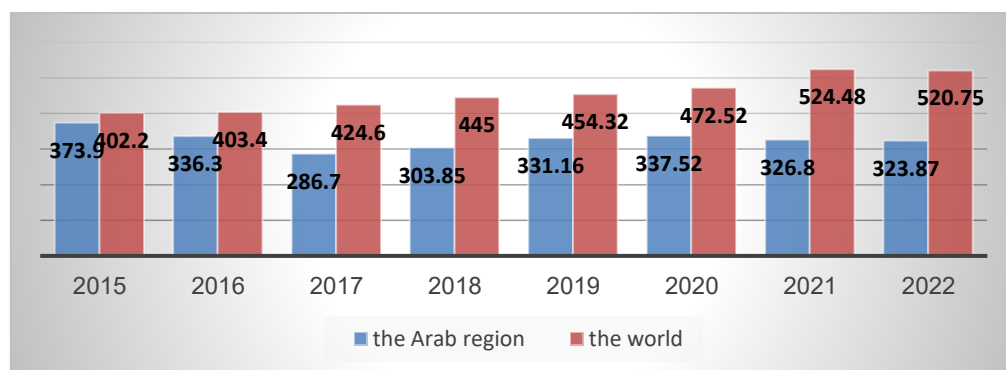
Years	2018	2019	2020	2021	2022	The rate of change between 2021 and 2022
The Arab region	6.67	6.47	5.75	6.28	7.63	%21
The world	11.26	11.26	10.86	12.13	12.42	%2

Source: The Arab Organization for Agricultural Development (2022), the Arab food security situations 2022, p. 29.

In 2022, the agricultural domestic product per capita in the Arab states exhibited significant variation, with Saudi Arabia (KSA) reaching the highest value at 551.66 USD per capita, while Djibouti recorded the lowest at 41.45 USD per capita.

Additionally, the overall agricultural domestic product in the Arab world saw a slight decrease of 0.9% compared to the general rate of 2021. Specifically, the agricultural domestic product per capita was estimated at 323.78 USD, in contrast to an international average of 520.75 USD per capita, as illustrated in **Figure 02**. This data reflects the disparities in agricultural productivity and economic conditions across the region.

Figure 02: The agricultural domestic product per capita during 2015-2022 (USD)



Source: The Arab Organization for Agricultural Development (2022), report on the situations of the Arab food security, different issues

2-3- Index of Food Utilization

The index of food utilization represents the socioeconomic aspects of food security at the family level. These aspects are closely related to knowledge and nutritional traditions, assuming that food is both available and accessible. Consequently, families determine the types of food to purchase, as well as how to prepare, consume, and distribute food within the household.

The utilization index assesses the diversity and nutritional quality of average meals, as well as food safety. This index is evaluated using five sub-indicators:

1. **Diversity of the Dietary System:** Measures the variety of foods consumed, which is crucial for meeting nutritional requirements and promoting health.
2. **Government Commitment to Improving Food Conditions:** Evaluates the efforts and policies implemented by governments to enhance food security and nutritional quality.
3. **Availability of Micronutrients:** Assesses the presence of essential vitamins and minerals in the food supply, which are vital for overall health.
4. **Protein Quality:** Measures the quality of protein sources available in the diet, focusing on their biological value and amino acid composition.
5. **Food Safety:** Evaluates the safety of the food supply, ensuring that food is free from contaminants and safe for consumption.

Together, these sub-indicators provide a comprehensive overview of how well food is utilized within a population, reflecting both nutritional adequacy and safety. (The Arab organization for agricultural development 2. , 2022, p. 26).

2-3-1- Main Foods Available for Consumption:

Food consumption is the final outcome of productive, marketing, and commercial efforts. In the Arab region, government production significantly contributes to the availability of most food products, with the exception of wheat, maize, vegetable oils, and sugar.

Table 05 illustrates the development of the main foods available for consumption during 2018-2022. The quantity of these foods available for

consumption includes both imported and locally produced items, after subtracting exports during the specified period.

Table 06: The main foods available for consumption during 2018-2022 (million tons)

year/crop	2018	2019	2020	2021	2022	Rate of overall food available for consumption in 2021 (%)	The rate of change between 2021 and 2022 (%)
Cereals	137	134.9	137.4	134.7	133.4	39.5	1 -
Tubers	16.1	16.4	16.5	16.3	16.4	4.9	0.5
Sugar	17.6	16.6	17	17	16.9	5	1 -
Legumes	4	4.4	4	4.2	4.2	1.2	1
Vegetables	58.5	54.7	57.9	57	56.5	16.7	0.9 -
Fruits	38.9	43.3	38.5	40.2	40.7	12	1.1
Fish	4.5	5.5	5.4	5.1	5.3	1.6	3.9
Eggs	2.8	2.9	2.6	2.8	2.7	0.85	1 -
Milk and its derivatives	33.7	32.6	36.9	34.4	34.6	10.3	0.7
Red meat	13.6	13.6	13.4	13.5	13.5	4	0.1 -
White meat	7.6	/	7.5	7.5	7.5	2.2	0
Total	340.4	/	338.3	338.9	337.8	100	0.3 -

Source: The Arab Organization for Agricultural Development (2022), report on the situations of the Arab food security 2022, Khartoum, p39.

In 2022, overall food consumption in the Arab region was estimated at 337.8 million tons, representing a slight decrease from 338.9 million tons in 2021. Cereals accounted for the largest share of this consumption, making up 40% of the total.

Plant-based products were the primary source of food, comprising 79.3% of the total food available for consumption, while animal and fish products contributed 20.7%.

Between 2021 and 2022, the amounts of various food categories experienced slight declines:

- **Cereals:** Decreased by 1%
- **Sugar:** Decreased by 1%
- **Vegetables:** Decreased by 0.9%
- **Eggs:** Decreased by 1%

These reductions were attributed to increased vegetable exports and declines in the availability of cereals, sugar, and eggs. This trend highlights the dynamic nature of food supply and consumption patterns in the region. (The Arab organization for agricultural development, 2021).

2-3-2 The food gap and the averages of self-sufficiency regarding the main food products:

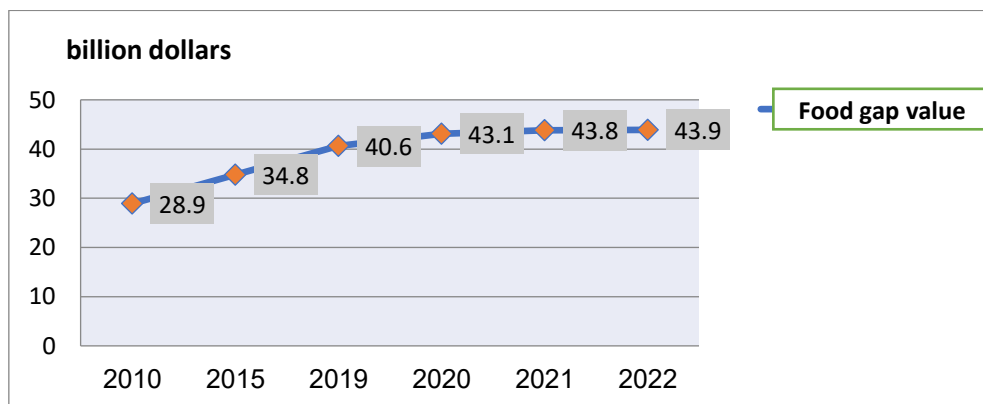
a. The Food Gap

The demand for food products in Arab states is rising without a corresponding increase in agricultural production to meet nutritional needs. This situation is further exacerbated by various social, economic, and environmental challenges, along with security issues, leading to a widening food gap.

Between 2021 and 2022, the food gap increased slightly by 0.2%, reaching \$43.9 billion. This growing food gap is a significant concern for the long term, having risen from \$34.8 billion to \$43.8 billion between 2015 and 2022. This reflects an annual growth rate of 3.4%.

The widening food gap underscores the urgent need for strategic interventions in agricultural production, food distribution, and policies aimed at enhancing food security in the region. (Arab Monetary Fund, 2023, p. 71). This change is illustrated in **Figure 03**

Figure 03: The development of the food gap in the Arab states (2010, 2015, and 2019-2022)



Source: The Arab Monetary Fund, (2023), the unified Arab economic report 2023, p. 71.

Cereals account for **5.47%** of the overall food gap in the Arab region. Within this category, the value of the wheat gap constitutes **43.6%** of the total value of cereals and represents **20.7%** of the overall Arab food gap. Other contributions to the food gap include:

- **Meat: 16.7%**
- **Milk: 11.3%**
- **Vegetable Oils: 9.4%**
- **Sugar: 5.7%**
- **Legumes: 3.4%**

Looking ahead, the food gap in the Arab region is expected to increase due to the disparity between demographic growth, which is estimated at **1.7%**, and the growth in agricultural and fish production, projected at **1.5%**. This imbalance highlights ongoing challenges in meeting food security needs amidst rising populations.

Moreover, the food gap is expected to widen due to several critical factors, including:

- **Limited Fertile Land:** A scarcity of arable land restricts agricultural expansion.
- **Soil Degradation:** Issues such as desertification and salinization diminish soil quality and productivity.
- **Unsustainable Agricultural Practices:** Practices that do not prioritize long-term sustainability can lead to resource depletion.

- **Small Farm Sizes:** Fragmented land holdings limit economies of scale and efficiency in production.
- **Rural Expansion:** Urbanization can lead to a loss of agricultural land and resources.
- **Climate Change:** Shifts in climate patterns can adversely impact agricultural yields and food production.

Conclusion

The Arab states have formulated strategic programs and plans aimed at achieving sustainable food security, enhancing self-sufficiency, and narrowing the food gap. Analyzing food security indicators in the Arab region from 2015 to 2022, along with examining the key strategies adopted by Arab states and agricultural organizations, we have found that:

- The cereals are the main food products in the Arab world, as they contribute the most to the gap of the main food products and to the planted surfaces. However, the cereals still represent the most imported goods in the Arab world, as the Arab states import half of the needed cereals.
- The other vegetal food products witnessed a relative stability in production, with increase in the late years, without achieving self-sufficiency, such as the case of raw sugar, legumes, and vegetal oils. On the other hand, vegetables and fruits make an important source of food in the Arab world and are highly consumed. In addition, their exports are an important resource for many states.
- The fish and animalistic production witnessed stability in production during 2015-2022, highly contributing to the levels of self-sufficiency in some products, and to surplus and export.
- The demand on the food products in the Arab states increases without an actual agricultural development that satisfies the food needs. This takes place amid socioeconomic, environmental, and security challenges in many states, what increases the food gap for many years.

Based on these findings and on the analysis of the strategies and plants of the specialized Arab organizations to achieve food security, we recommend that:

- It is necessary to focus on agricultural production using modern technology in developing agricultural projects and researches.
- To reduce the food gap, the agricultural production must increase more than the population. Under the limited agricultural resources, the Arab states need a multilateral cooperation to optimally exploit the available resources and invest in the modern agricultural techniques.
- The Arab cooperation must be fostered for its necessity through adopting a common Arab agricultural strategy that achieves food security.

- Common strategies, policies, and plans based on scientific bases and exact achievable plans and goals must be established, with focus on the big relative advantages of the wide and different Arab environments.
- Financial allocations for strategies and programs need to be increased to ensure the effective implementation of plans and the attainment of goals that will enhance food security in the Arab world..

Bibliography

- Al Cirti, M. (2000). *Food security and the economic development: Islamic vision-applied study on some Arab states*. Alexandria: New university for publication.
- Arab monetary Fund. (2022). The unified Arab economic report 2022. Abu Dhabi: Arab monetary Fund.
- Arab Monetary Fund. (2023). The unified Arab economic report 2023. Abu Dhabi: Arab Monetary Fund.
- Assaf, A., & al Wadi, M. (2011). planning and economic development. Amman: Massira house for publication, distribution, and printing.
- Austin, F. (2021). What is food security. Récupéré sur Concern Worldwide: <https://www.concern.net/news/what-food-security>
- Bouaziz, O. (2022). Classification of Arab contries according to food security indicators using hierarchical cluster analysis for the period 2015-2020. *Al Maqrizi gournal for the economic and financial studies*, 74-94.
- Carr., E. (2006). stmodern conceptualization, modernist applications M rethinking the role of society in food security. *Food Policy*.
- Houchine, K. (2006-2007). the problematic of agricultural estate and the development of the food security in Algeria. Algiers: University of Algiers.
- Peng, W., & berry, E. (2019). the concept of food security. *ncyclopedia of Food Security and Sustainabilit*.
- Salem Toufik, E. (2009). the Arab food security: approaches to hunger industry. Beirut: Arab unity studies center.
- the Arab Organization for Agricultural Development. (2017). The Arab food security situations 2017. Khartoum: The Arab Organization for Agricultural Development.
- The Arab organization for agricultural development. (2021). Arab food security situations 2021. Khartoum: The Arab organization for agricultural development.
- The Arab organization for agricultural development, 2. (2022). The Arab food security situations 2022,. Khartoum: The Arab organization for agricultural development.
- Zaoui, B. (2015-2016). thebanking funding: support and developing the agricultural sector in Algeria -qualitative approach-. Mascara: University of Mostefa Istambouli in Mascara.