Food security indicators: case of Algeria 2022

CHERIEF Wahida

University Moulod Mammeri of Tizi Ouzou (Algeria), wahida.cherief@ummto.dz

Received: 03/01/2023 **Accepted: 15./02/2023** **Published:30/03/2023**

Abstract:

The problem of food security is considered one of the important issues that must be taken into consideration, due to its connection to human life, the continuity of humanity, and the guarantee of its activity and productivity.

This study aims to address the theoretical aspect of food security through different definitions of international organizations concerned with global food security and combating poverty and hunger. He explained its various dimensions and explained the difference in terms close to it, such as food self-sufficiency, food sovereignty, food safety and factors affecting food security.This study reviews the global food security indicators for Algeria of the year 2022

Key words: food security, global food security index

الملخص

تعتبر مشكلة الأمن الغذائي من القضايا المهمة التي يجب أخذها بعين الاعتبار، لارتباطها بحياة الإنسان، واستمرارية البشرية، وضمان نشاطها وإنتاجيتها .تهدف هذه الدراسة إلى تناول الجانب النظري للأمن الغذائي من خلال التعريفات المختلفة للمنظمات الدولية المعنية بالأمن الغذائي العالمي ومكافحة الفقر والجوع .وشرح أبعاده المختلفة وأوضح الفرق بمصطلحات قريبة منه مثل الاكتفاء الذاتي الغذائي والسيادة الغذائية والسلامة الغذائية والعوامل المؤثرة على الأمن الغذائي. وتستعرض هذه الدراسة مؤشرات الأمن الغذائي العالمي للجزائر لسنة 2022

الكلمات المفتاحية: الأمن الغذائي، مؤشر الأمن الغذائي العالمي

Introduction :

Food is one of the primary physiological needs for human life and ensuring the continuity of the human race. Therefore, the individual, society and governments seek to secure food in sufficient quantity and appropriate quality at all times.

Food security is a pressing global problem that affects billions around the globe (WHO, world Health Organization, 2021). The most recent data from the Food and Agriculture Organization (FAO) shows that nearly one in three people don't have access to sufficient food supplies. Because of this, food security became a vital component of Goal to Zero Hunger of the Sustainable Development Goals (FAO, Food security and nutrition for all, 2021);

Food is a fundamental human right. Article 25 of the Universal Declaration of Human Rights (UDHR) includes food as one of the basic rights for "a standard of living adequate for health and well-being." Needless to say, food is a basic need to sustain life.

Food security is one of the important issues faced by developed and developing countries alike, especially with the huge changes in the food market caused by armed conflicts, climate changes and changes in food prices. What made food security a strategic issue that countries work to achieve.Because of that this research paper aims to answer the question:what is the theoretical frame of food security?Its various measurement indicators?And,what are food security indicators for Algeria for the year 2022?

1. What is food security?

The concept of food security has developed since the 1974 World Food Conference, wherethe term food security was used for the first time, which witnessed the firstitem of the International Declaration on the Elimination of Hunger and Malnutrition that was adopted by governments, "Every man, woman and child has the inalienable right to be free from hunger and malnutrition in order to fully develop and preserve their physical capabilities And mental " (Macer, 2015)

There are several definitions of food security; we shall refer to the most commonly accepted definitions:

- **Definition of Rome Declaration about World Food Security 1996:**Food security exists when all people have, at all times, physical and economic access to sufficient, safe and nutritious food to meet their energy needs and food preferences for leading healthy and active lives. In this regard, concerted action at all levels is needed (FAO, 1996).
- **Definition of the Food and Agriculture Organization (FAO):** Availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices (FAO, 2006).
- **The definition of the World Bank in its report on poverty and hunger in 1986**: Food security was defined as: "All people at all times have enough food to lead an active healthy life." (Clay, 2002)

- **According to Food and Agriculture Organization**:food and nutrition security is defined as the situation where all human beings have physical, social and economic access to food at all times, in sufficient quantity and of suitable quality in terms of variety, diversity, nutrients and health security to meet their energy needs and food preferences and can thus lead to healthy and active lives, while benefiting from a sanitary environment and adequate health, education and care services. Indeed, in addition to availability, access, usage of food and the stability of these conditions, emphasis is also placed on the nutritional quality of food and on all the sanitary and hygienic conditions in which individuals live(FAO s. , 2020)

From the above definitions, we note that the concept of food security has evolved over time, as in the beginning the focus was on the element of availability and although it is a necessary element it is not sufficient to achieve food security, food may be available but it cannot be reached, while the current concept Food security is a multi-dimensional concept based on access to and access to food, food safety, and that food is appropriate for the tastes of individuals, and ensures an active healthy life, that meaningthe concept has evolved from quantitative to qualitative issues, The concept has also evolved from a holistic level (international and national) to a partial level (family and individual level) (Rahmani, 2020).

2. Making difference betweenFood security, food self-sufficiency, food sovereignty and food safety concepts:

The concepts of food security, food self-sufficiency, food sovereignty and food safety are often confused. Therefore, it is better for us to address these concepts accurately in order to clarify them and understand the difference between them

2.1. Food self-sufficiency: Food self-sufficiency is the capacity of a country to satisfy all the food requirements of its population from its national production alone. Self-sufficiency is a central element in the food policies of countries which seek total economic and political independence, as had been the case at one stage of the USSR in its cold war struggle with the US. But the pursuit of self-sufficiency has been shown to be dangerous for a country, as it makes it especially vulnerable to any hazard, weather-related or other, that may impact negatively on its production. There are two main characteristics that differentiate these two concepts (Materne, 2013):

- Food security is a broader concept than self-sufficiency, to the extent that it encompasses the possibility of a country using its capacity to import food and not depend just its national production capacity to meet its food needs.
- Food security and food self-sufficiency do not have the same goal: while the sole objective of food security is to satisfy all the food requirements of the population, regardless of the source, self-sufficiency gives at least the same level of priority to achieving political and economic independence. This gives this latter concept a stronger political meaning. It is this second point that constitutes the main difference between the two concepts.

From an economic point of view, food security relies heavily on international trade, selling goods that the country produces efficiently and importing goods that it is not so good at producing, following the principle of ‘‘comparative advantage’’. Food security can therefore be achieved by a country that does not produce sufficient food for itself but has the money required, by exporting other products, to purchase food on the world market. Food security therefore may, in some cases, depend heavily on the terms of trade between exported goods and food, and on world food market conditions. This dependence on the market has been felt strongly since the recent food crisis and the increase of global food prices and has encouraged some countries to aspire to higher levels of self-sufficiency.

2.2. Food sovereignty: Food sovereignty is presented as ‘‘the RIGHT of peoples, communities, and countries to define their own agricultural, labor, fishing, food and land policies which are ecologically, socially, economically and culturally appropriate to their unique circumstances. It includes the true right to food and to produce food, which means that all people have the right to safe, nutritious and culturally appropriate food and to food-producing resources and the ability to sustain themselves and their societies’’ (NGO/CSO, June 8 – 13, 2002.)

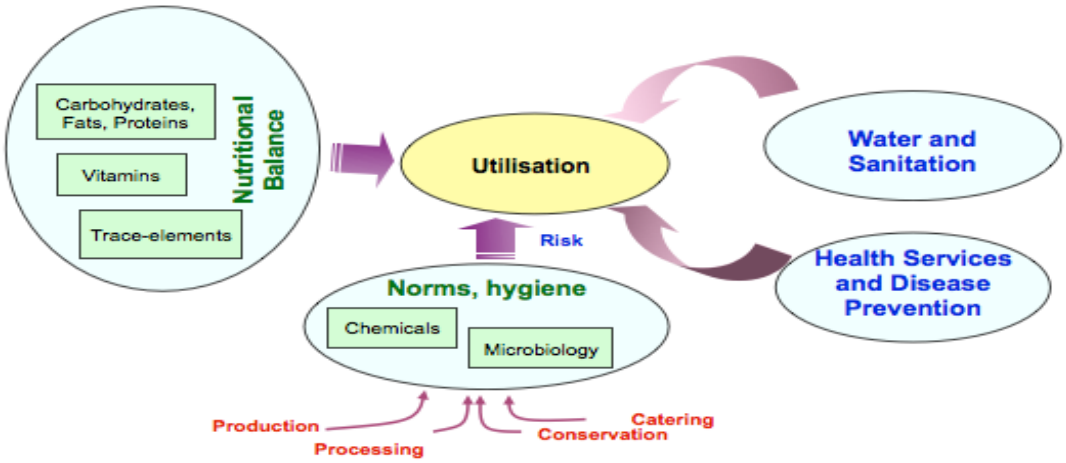
Food sovereignty includes(Campesina, 2003):

- ‘‘Prioritizing local agricultural production in order to feed the people, access of peasants and landless people to land, water, seeds, and credit. Hence the need for land reforms, for fighting against GMOs (Genetically Modified Organisms), for free access to seeds, and for safeguarding water as a public good to be sustainably distributed.
- The right of farmers, peasants to produce food and the right of consumers to be able to decide what they consume, and how and by whom it is produced.
- The right of Countries to protect themselves from too low priced agricultural and food imports.
- Agricultural prices linked to production costs : they can be achieved if the Countries or Unions of States are entitled to impose taxes on excessively cheap imports, if they commit themselves in favor of a sustainable farm production, and if they control production on the inner market so as to avoid structural surpluses.
- The populations taking part in the agricultural policy choices.
- The recognition of women farmers' rights, who play a major role in agricultural production and in food’’.

Food sovereignty has a much more political content than food security as it is inspired by several aspects of the Right to Food.

2.3. Food safety :it is also important to note that there is often confusion between the terms “food security” and “food safety”, especially when translations are being made. Food safety is concerned especially with the assurance that food is not damaging to the health of consumers because of contamination by harmful organisms or toxic products.

Figure1:Drivers of food production: availability



Source:(Materne, 2013)

3. The Four Dimensions of Food Security:From food security definition, four main dimensions of food security can be identified (FAO, An Introduction to the Basic Concepts of Food Security, 2019).

3.1. Availability: Availability refers to the physical existence of food. On national level food availability is a combination of domestic food production, commercial food imports and exports, food aid and domestic food stocks. On household level food could be from own production or bought from the local markets. Regarding food production, water resources are required to produce the crops. Due to population growth and climate change, the pressure on existing natural resources, namely land and water, increases. Impacts of climate change are often leading to land degradation, lack of irrigation water, reduced soil moisture and therefore losses of economic livelihoods. Together with an increase in conflicts over usage of water resources (cultivation of crops for energetic use vs. cultivation of crops for nutritional use, use by other sectors like drinking water, industry and environment), this may be a threat for long-term food security. The Stockholm International Water Institute (SIWI) emphasizes the growing importance of green water, i. e. the water hidden in the ground as soil moisture (while blue water refers to water available in lakes, rivers and aquifers). (Klennert, 2010)With suitable adaptation measures to soil such as irrigation systems improving water-use efficiency through cultivation methods and technologies, or infrastructure development for water harvesting and (re)use of marginal quality water and treated waste water, or improved soil-water management in rain fed systems like, the resilience of agricultural systems can be strengthened, risks reduced and livelihoods secured. Support of local water user groups and strengthening their planning and management skills can help minimize risks of scarce resources and reduce conflicts (USAID, 1995)

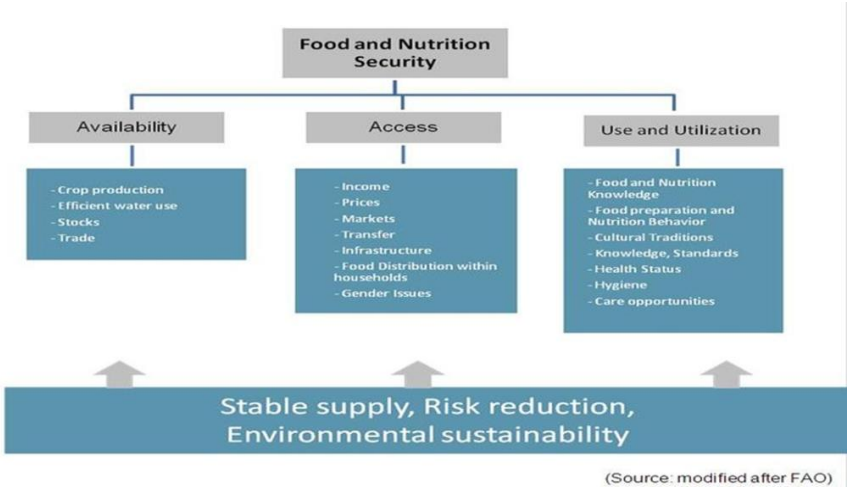
3.2. Food access: Access is ensured when all households have enough resources to obtain food in sufficient quantity, quality and diversity for a nutritious diet. This depends mainly on the amount of household resources and on prices. In addition, accessibility is also a question of the physical, social and policy environment. Drastic changes in these dimensions may seriously disrupt production strategies and threaten food access of affected

households. As an example, developing countries may be affected by severe droughts or floods more and more frequently. Accordantly, the harvest volume shrinks and the prices for food increase, affecting on the availability and accessibility of food for households. To prevent such negative developments, different technical adaptation measures exist. The construction of infrastructure such as small dams and reservoirs or water spreading weirs to hold back water and raise the shallow groundwater tables is one of them, dykes and improved drainage systems for floods are other ones. In addition, the preservation and rehabilitation of ecosystems, flood sensitive planning or early warning systems and emergency plans further enhance the capabilities to deal with extreme weather events and to preserve the physical environment (USAID, 1995) ;

3.3. Utilization: Use describes the socio-economic aspects of household food and nutrition security, determined by knowledge and habits. Assuming that nutritious food is available and accessible, the household has to decide what food to purchase and how to prepare it as well as how to consume and allocate it within the household. Another aspect is the biological utilization. This relates to the ability of the human body to take food and convert it. This gained energy is very important when it comes to daily physical activities, for example working in agriculture. Beside that utilization requires a healthy physical environment and adequate sanitary facilities as well as the understanding and awareness of proper health care, food preparation, and storage processes. In this context safe drinking water plays an important role, especially for preparing food and creating a healthy environment for the population. Safe drinking water is connected to groundwater which is often contaminated through human, industrial or agricultural waste water in combination with other factors 884 million people worldwide have no access to adequate drinking water (USAID, 1995)

3.4. Stability: to be food secure, a population, household or individual must be able to get adequate food all times. They should not lack food as a result of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity). The concept of stability can therefore refer to both the availability and access aspects of food security (FAO, An Introduction to the Basic Concepts of Food Security, 2019).

Figure 2: the four dimensions of food security



4. Factors affecting food security: Food security continues to face several challenges through the years. While most of them are not new, these factors worsen the existing inequalities in the global food systems. This section discusses the major factors that impact food security.

4.1. Energy Security: Energy security is one of the essential factors for a functional food system. From production to processing, agriculture consumes a lot of energy from gas, electricity, and fuel to keep things running. Moreover, fertilizers, pesticides, and other chemicals needed for agriculture also require energy for production.

The recent international conflict has led to a sharp increase in energy prices. The sanctions imposed on Russia, a key player in the global energy market, have impacted the global food systems—from higher production costs, disrupted food supply chains, to rising food prices.(food, 2021)

4.2. Climate Change: Climate change and food security have strong links with each other. Extreme weather events, drought, and seasonal changes reduce yield growth, productivity, and availability of food supplies. Thus, food production systems need measures in order to adapt to climate change.

Food production is also a major contributor to global warming. For one, this sector generates a quarter of the total Greenhouse Gas Emissions (GHGs). Moreover, food production occupies 50% of the habitable lands(Oecd, 2022).

The sheer number of resources consumed in producing food calls for a more sustainable and climate-resilient approach to food production.

4.3. Population Growth The United Nations projects the world population to reach 8.5 billion by 2030. This projected growth requires an increase in food production by 70 percent, according to UN DESA. Given this, food systems must keep up with the demands of the growing population.Food security is essential in sustaining a healthy future for everyone. It means healthy food choices, sustainable farming practices, and equitable access for people of all incomes (Nations, 2022).

4.4. COVID-19 Pandemic: The COVID-19 pandemic devastatingly impacted multiple sectors, including food systems. For example, it led to one of the biggest annual increases in global hunger in decades.

Efforts to contain the pandemic have restricted physical access to food sources. For example, travel restrictions, quarantines, and lockdowns made it difficult for people to buy food. Moreover, border closures disrupted food supply chains and turned economies upside-down.

Low-income households dealt with the worst blow. For one, the pandemic narrowed down their already limited food choices. There are also those who lost their jobs, eliminating their means of livelihood and funds for purchasing meals and food ingredients(FAO, THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD, 2021).

4.5. Rising Food Prices: Food prices have been volatile since 2019. Multiple factors—climate change and the COVID-19 pandemic, for example—have landed a tremendous blow on food production. In turn, they push up the costs of nutritious food sources.

In 2019, around three billion people cannot afford nutritious meals. When 2020 came, the cost of a healthy diet rose to almost five times as much as meals with minimal nutrition.

The underprivileged suffer the brunt of the rising prices, making it more challenging to afford the costs of healthy meals. Because they cannot afford healthy meals, low-income households sometimes (unknowingly) resort to cheap but unhealthy food that happens to be readily available. At worst, they would skip meals for an entire day or two. This practice puts them at risk of malnutrition and several diseases (impact, global food security index, 2022).

4.6. Water Security: Water, just like energy, is essential to food security. After all, it's a necessary element in growing crops and raising livestock for food. For example, irrigation boosts the volume and variety of harvested fruits and vegetables all year round.Recent data show that agriculture is the largest water user on the globe. This sector consumes almost 70 percent of the freshwater reserves for human use. Moreover, by 2050, its water consumption is expected to increase by 19 percent.However, the world is running out of freshwater supplies. Contamination, extreme weather, and droughts plague the already limited water reserves. If this continues, it could further affect the global food production system, especially the fisheries sector (IFPRI, 2019).

4.7. Conflicts: From the Second World War to the ongoing conflict between Russia and Ukraine, wars continue to harshly impact food production systems around the world.

For one, these two countries produce a quarter of the global wheat supply, making them the largest suppliers of grains around the world. Ukraine, for example, delivers 40 percent of wheat and corn to Africa and the Middle East. But because of the halt in grain supply, those regions face food shortages and food price hikes.

Aside from this, Russia is also a major producer of fertilizer. They contribute around 15 percent of the global nitrogenous fertilizer exports and 17 percent of the global potash fertilizer trades. As the fertilizer prices continue to spike, so will the food prices by about 30 percent (IFPRI, War and hunger: Ukraine crisis and food insecurity in Asia (Bulatlat) , 2022).

4.8. Safety: Lastly, food safety has close links with food security. After all, quality food is a must to sustain life. Safe food preparation, handling, and storage are keys to ensuring good health for everyone.

If food is contaminated, it could negatively impact people's health. Unsafe food can put people at risk of more than 200 diseases. The World Health Organization (WHO) reports that each year, around 600 million people become sick after eating contaminated food.

Access to and availability of safe food are also other factors to consider. For example, poverty-stricken regions have limited access to safe, nutritious food sources. Areas experiencing food deserts and famines are also deprived of nourishment due to a lack of safe food supply (WHO, 2022).

5. Definition of Food Insecurity:

Food Insecurity, on the other hand, will occur when there are problems at any one level in the food production-consumption pathway. The upstream dimension/level of Food Insecurity largely affects those downstream. The definition of Food Insecurity is "whenever the availability of nutritionally adequate and safe foods, or the ability to acquire

acceptable foods in socially acceptable ways, is limited or uncertain" (expert panel, 1990)Food insecurity, as practically measured in the United States, is experienced when there is(Council, 2006):

- uncertainty about future food availability and access,
- insufficiency in the amount and kind of food required for a healthy lifestyle
- The need touse socially unacceptable ways to acquire food.

Apart from the most common constrained lack of economic resources, food insecurity can also be experienced when food is available and accessible but cannot be utilized because of physical or other constraints, such as limited physical functioning of the elderly or disabled.

However, with the emphasis on health equity, focus should be given to the people under the most disadvantaged conditions.

They are under various natural and man-made stresses such as floods, droughts, conflicts and wars. They also have urgent demand for better coping strategies for food insecurity. Paradoxically, the groups of subjects most food insecure, such as migrants, displaced persons and homeless, are not usually included in surveys of food security, which consequently underestimate the problem.

6. Global food security index

The Global Food Security Index (GFSI) is produced annually since 2012 by the Economist Intelligence Unit (EIU) and covers more than 100 countries. The conceptual framework of the GFSI, based on three dimensions of food security, namely **affordability**, **availability**, **quality and safety and sustainability and adaptation**(EIU, 2022)**:**

- **Affordability**: Measures the ability of consumers to purchase food, their vulnerability to price shocks and the presence of programs and policies to support consumers when shocks occur.
- **Availability:** Measures agricultural production and on-farm capabilities, the risk of supply disruption, national capacity to disseminate food and research efforts to expand agricultural output.
- **Quality and safety**: Measures the variety and nutritional quality of average diets, as well as the safety of food.
- **Sustainability and adaptation:** Assesses a country's exposure to the impacts of climate change; its susceptibility to natural resource risks; and how the country is adapting to these risks.

The three dimensions are populated by 19 indicators formed by **28 individual indicators**. The indicators were selected on the basis of EIU expert analysis and consultation with a panel of food-security specialists. the GFSI includes

- **Quantitative** indicators from national and international statistical organizations. Where there were missing values in quantitative or survey data, the EIU has used estimates.

- **Qualitative** indicators either created by the EIU, based on information from development banks and government websites, or drawn from a range of surveys and data sources and adjusted by the EIU

Nine out of the 28 indicators are calculated by qualitative scoring by EIU analysts. Qualitative scoring requires the subjective judgment of the team of experts who designed

The main data sources used in the GFSI are the EIU, the World Bank Group, the International Monetary Fund (IMF), the UN Food and Agriculture Organization (FAO), the UN Development Program (UNDP), the World Health Organization (WHO), the World Trade Organization (WTO), the World Food Program (WFP), Agricultural Science and Technology Indicators (ASTI) and national statistical offices.

Indicator scores are normalized (min-max rescaling) and are scaled from 0 to 100, with 100 corresponding to the most favorable situation. The scores at the dimension level correspond to the weighted mean of underlying indicators. The overall GFSI score is a weighted average of the dimension scores. The default weights are averages of the weightings suggested by the members of an expert panel. To assess how the weighting scheme is affecting the final ranking of countries;

7. Algeria's Global Food Security index 2022:

Algeria is one of the 113 countries in the index which were selected by Economist Impact based on regional diversity, economic importance, population size (countries with larger populations were chosen so that a greater share of the global population is represented) and the goal of including regions around the globe. The countries included in the 2022 index are represented in the table below:

7.1. Algeria'soverall ranking and score 2022

Table1: 2022 GFSI overall rankings table

Rank / 113	Country	Score / 100	Rank / 113	Country	Score / 100	Rank / 113	Country	Score / 100
1	Finland	83.7	39	South Korea	70.2	77	Egypt	56.0
2	Ireland	81.7	40	Panama	70.0	78	Cambodia	55.7
3	Norway	80.5	41	Malaysia	69.9	79	Sri Lanka	55.2
4	France	80.2	41	Saudi Arabia	69.9	80	Bangladesh	54.0
5	Netherlands	80.1	43	Mexico	69.1	81	Laos	53.1
6	Japan	79.5	43	Russia	69.1	82	Kenya	53.0
7	Canada	79.1	45	Romania	68.8	83	Ghana	52.6
7	Sweden	79.1	46	Vietnam	67.9	84	Pakistan	52.2
9	United Kingdom	78.8	47	Jordan	66.2	85	Mali	51.9

10	Portugal	78.7	48	Ecuador	65.6	86	Senegal	51.2
11	Switzerland	78.2	49	Turkey	65. 3	87	Botswana	51.1
12	Austria	78.1	50	Kuwait	65.2	88	Rwanda	50.6
13	United States	78.0	51	Brazil	65.1	89	Burkina Faso	49.6
14	Denmark	77.8	52	Bolivia	65.0	90	Tanzania	49.1
14	New Zealand	77.8	52	Dominican Rep.	65.0	91	Benin	48.1
16	Czech Republic	77.7	54	Argentina	64.8	91	Malawi	48.1
17	Belgium	77.5	55	Belarus	64.5	93	Uganda	47.7
18	Costa Rica	77.4	56	El Salvador	64.2	94	Mozambique	47.3
19	Germany	77.0	57	Morocco	63.0	95	Côte d'Ivoire	46.5
20	Spain	75.7	58	Guatemala	62.8	96	Cameroon	46.4
21	Poland	75.5	59	South Africa	61.7	97	Niger	46.3
22	Australia	75.4	60	Honduras	61.5	98	Togo	46.2
23	United Arab Emirates	75.2	61	Serbia	61.4	99	Guinea	45.1
24	Israel	74.8	62	Tunisia	60.3	100	Ethiopia	44.5
25	Chile	74.2	63	Indonesia	60.2	101	Angola	43.7
25	China	74.2	64	Colombia	60.1	102	Zambia	43.5
27	Italy	74.0	64	Thailand	60.1	103	Chad	43.2
28	Singapore	73.1	66	Azerbaijan	59.8	104	Congo (Dem. Rep.)	43.0
29	Bulgaria	73.0	67	Philippines	59.3	105	Sudan	42.8
30	Qatar	72.4	68	Algeria	58.9	106	Venezuela	42.6
31	Greece	72.2	68	India	58.9	107	Nigeria	42.0
32	Kazakhstan	72.1	70	Paraguay	58.6	108	Burundi	40.6
33	Uruguay	71.8	71	Ukraine	57.9	108	Madagascar	40.6
34	Hungary	71.4	72	Myanmar	57.6	110	Sierra Leone	40.5
35	Oman	71.2	73	Uzbekistan	57.5	111	Yemen	40.1

36	Slovakia	71.1	74	Nepal	56.9	112	Haiti	38.5
37	Peru	70.8	75	Tajikistan	56.7	113	Syria	36.3
38	Bahrain	70.3	76	Nicaragua	56.6			

Source:https://impact.economist.com/sustainability/project/food-security-index/reports/Economist_Impact_GFSI_2022_Global_Report_Sep_2022.pdf, consulted on: June20th, 2023

From the table above(table1) , Algeria is ranked 68thout of 113 countries, and the value of the index is estimated: 58.2% in the same ranking with India.

7.2. Algeria's sub indicators of food security:

Table2: Algeria's sub indicators of food security 2022

Overall score	Affordability	Availability	Quality and Safety	Sustainability and Adaptation
58.2%	66.8%	57.3%	54.7%	54.2%
68th	64th	63rd	82nd	56th

Source: personal design from https://impact.economist.com/sustainability/project/food-security-index/explore-countries/algeria consulted on: July 25th, 2023

According to table2 the sub indicators of food security for Algeria are as follows:
Affordability: Rank 64, Index 66.8%.
Availability: Rank 63, index 57.3%.
Quality and Safety: Rank 82, index 54.7%.
Sustainability and Adaptation: Rank 56, index 54.2%.

These results refer to several factors which detail the scores indicated in the previous table, the details will be represented in the following tables.

7.3. Algeria's sub indicators of food security scores details:

7.3.1.Affordability:

Table3: Algeria's Affordability of food security scores details

Sub indicator	Algeria's Score	Mean average score
Change in average food costs	48.5	70.7
Proportion of population under global poverty line	92.6	76.6
Inequality adjusted income index	63.1	55.5

Agricultural trade	50.0	67.6
Agricultural import tariffs	41.1	63.3
Trade freedom	57.4	71.3
Food safety net programs	79.3	72.4
Presence of food safety net programs	100	97.3
Funding for food safety net programs	100	57.5
Coverage of food safety net programs	100	68.1
Operation of food safety net programs	00	64.6

Source: personal design from https://impact.economist.com/sustainability/project/food-security-index/explore-countries/algeriaconsulted on: July 25th, 2023

7.3.2. Availability

Table4: Algeria's Availability of food security scores details

Sub indicator	Algeria's Score	Mean average score
Access to agricultural inputs	49.0	57.6
Access to finance and financial products for frams	50.0	74.3
Access to diversified financial products	50.0	54.9
Agriculture producer prices	93.7	23.7
Access to extension services	50.0	79.2
Community organizations	50.0	83.6
Empowering women framers	0.0	28.3
Agricultural research and development	43.1	47.1
Public expenditure on agricultural research and development	18.5	29.5

Access to agricultural technology, education and resources	71.2	54.3
Commitment to innovative technologies	33.3	54.9
Farm infrastructure	54.1	55.7
Crop storage facilities	100	85
Irrigation infrastructure	6.6	20.5
Access to market data and mobile banking	61.6	66.3
Volatility of agricultural production	78.2	68.7
Food loss	58.2	75.5
Supply chain infrastructure	34.4	47.8
Planning and logistics	36.3	49.4
Road infrastructure	25.0	45.6
Airport and rail infrastructure	42.5	48.4
Sufficiency of supply	100	61.9
Food supply adequacy	100	58.5
Dependency on chronic food aid	100	65.5
Political and social barriers to access	42.1	58.7
Armed conflict	50.0	71.5
Political stability risk	30.0	51.6
Corruption	25.0	39.4
Gender inequality	57.1	65.5
Food security an access policy commitments	52.5	47.1
Food security strategy	100.0	60.2
Food security agency	00	32.7

Source: personal design from https://impact.economist.com/sustainability/project/food-security-index/explore-countries/algeria consulted on: July 25th, 2023

7.3.3.Quality and Safety

Table 5:Algeria'sQuality and Safety of food security scores details

Sub indicator	Algeria's Score	Mean average score
Dietary diversity	49.1	52.5
Share of non-starchy foods	38.8	48.4
Share of sugar consumption	67.0	59.7
Nutritional standards	0.0	63.7
National dietary guidelines	0.0	42.5
National nutrition plan or strategy	0.0	69.0
Nutrition labeling	0.0	59.3
Nutrition monitoring surveillance	00	77.9
Micronutrient availability	64.7	67.8
Dietary availability of vitamin A	100	88.5
Dietary availability of iron	48.0	49.3
Dietary availability of zinc	42.2	64.3
Protein quality	67.3	68.5
Food safety	92.4	76.4
Relevant food safety legislation	100	70.8
Food safety mechanisms	80.0	68.7
Access to drinking water	91.5	82.1
Ability to store food safely	99.8	83.8

Source: personal design from https://impact.economist.com/sustainability/project/food-security-index/explore-countries/algeria consulted on: July 25th, 2023

7.3.4. Sustainability and Adaptation

Table 6:Algeria's Sustainability and Adaptation of food security scores details

Sub indicator	Algeria's Score	Mean average score
Exposure	76.2	67.9
Temperature rise	85.2	70.5
Drought	25.0	42.7
Flooding	100.0	66.2
Sea level rise	100	97.3
water	33.7	41.2
Agricultural water risk-quantity	00	40.9
Agricultural water risk-quality	75.0	41.6
Land	64.7	61.3
Land degradation	100.0	69.6
Grassland	98.0	85.3
Forest change	73.0	69.6
Soil organic content	1.1	29.1
Oceans, rivers and lakes	26.6	41.5
Eutrophication	50.0	45.6
Marine biodiversity	6.3	38.0
Political commitment to adaptation	28.5	55.8
Climate finance flows	1.2	49.8
Environmental-economic accounting implementation	0.0	58.4

Early-warning measures/ climate smart agriculture	0.0	44.2
Commitment to managing exposure	15.4	38.7
National agricultural adaptation policy	100.0	79.6
Sustainable agriculture	50.0	63.7
Disaster risk management	100.0	55.7
Pest infestation and disease mitigation	100.0	69.9
Risk management coordination	100.0	39.7

Source: personal design from https://impact.economist.com/sustainability/project/food-security-index/explore-countries/algeria consulted on: July 25th, 2023

Conclusion:

The factors that affect food security are closely linked with one another. Thus, improving food security requires a multi-faceted approach to food systems. Combining several strategies into a holistic program ensures that each pillar of food security is addressed adequately, many countries such Algeria can adapt the follows strategies to consider for strengthening food security efforts:

Collecting data and inform decision-makers of the current state of the food systems—from consumption and expenditure to risks and markets. This way, they can develop effective and evidence-based food security and nutrition programs.However, collecting adequate food data remains a challenge for developing nations. To address this, FAO recommends digging deeper into food consumption patterns. For example, asking participants about the number of meals they consume daily provides a clearer picture of the accessibility and availability of food items in a specific area.

After data is collected, these findings are put into practice through legislation and policies. This means thinking ahead and creating sustainable farming practices to increase productivity. Designing cohesive diets is a must to move this endeavor forward.

Integrating risk management plans, strategies, and tools is key in adapting to current and future risks. By strengthening resilience to markets, climate, and other factors, governments can improve their food security.

Investing across agricultural value chains helps build strong, resilient, and reliable food systems. This effort includes equipping farmers with the right tools to prepare for risks and increase productivity, thus enhancing food security in the long term.

References:

Ashley, J. (2016). *Food security in the developing world.* Academic Press.

Babu, S., Gajanan, S. N., & Sanyal, P. (2014). *Food security, poverty and nutrition policy.*

Campesina, V. (2003, january 15). *food sovereignty*. Consulté le june 15, 2023, sur https://nyeleni.org/IMG/pdf/Foodsov_triptico_english-2-2.pdf

Clay, E. (2002). *Food Security: Concepts And Measurement.* Retrieved july 25, 2023, from http://www.fao.org/3/y4671e/y4671e06.htm#fn21

Council, N. R. (2006). *Food Insecurity and Hunger in the United States: An Assessment of the Measure.* Washington, DC: National Research Council.

E. Carr. (2006). *Postmodern conceptualization, modernist applications: Rethinking the role of society in food security, Food Policy 31* .

EIU. (2022). *Global food securiry index* .

EIU. (2022, september). *Globale food security index2022*. Retrieved july 25, 2023, from Globale food security index2022: https://impact.economist.com/sustainability/project/food-security-index/reports/Economist_Impact_GFSI_2022_Global_Report_Sep_2022.pdf

expert panel, o. t. (1990).

FAO. (1996). *Déclaration de Rome sur la sécurité alimentaire mondiale.*Rome- Italy: FAO press.

FAO. (2006). *Food Security. policy brief.* issue 2.

FAO. (2019). *An Introduction to the Basic Concepts of Food Security.*Consulté le july 25, 2023, sur http://www.fao.org/3/al936e/al936e00.pdf,

FAO. (2021). *Food security and nutrition for all*. Consulté le July 6, 2023, sur FAO: https://www.fao.org/food-security-and-nutrition-for-all/background/en/

FAO. (2021). *THE STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD*. Consulté le june 26, 2023, sur FAO: https://www.fao.org/3/cb4474en/online/cb4474en.html#chapter-2_1

FAO, s. (2020). *Food and Agriculture Database.*Consulté le june 25, 2023, sur FAO: http://www.fao.org/faostat/fr/

food, e. f. (2021, november 8). *energy for food* . Consulté le june 20, 2023, sur wfp: https://www.wfp.org/energy-for-food-security

IFPRI. (2019, june 12). *Food security depends on water security – and we need to act now*. Consulté le june 25, 2023, sur Internationanl Food Policy Research Intitute : https://www.ifpri.org/blog/food-security-depends-water-security-%E2%80%93-and-we-need-act-now

IFPRI. (2022, March 21). *War and hunger: Ukraine crisis and food insecurity in Asia (Bulatlat)* . Consulté le June 25, 2023, sur International Food Policy Research Institute: https://www.ifpri.org/news-release/war-and-hunger-ukraine-crisis-and-food-insecurity-asia-bulatlat%E2%80%AF

impact, E. (2022). *global food security index*. Consulté le june 25, 2023, sur https://impact.economist.com/sustainability/project/food-security-index/

impact, E. (2022). *Global Food Security Index* . Consulté le july 20, 2023, sur https://impact.economist.com/sustainability/project/food-security-index/explore-countries/algeria

Klennert, K. (2010). *Achieving Food and Nutrition Security.* Retrieved june 25, 2023, from https://wocatpedia.net/images/f/f3/Inwent_%282009%29_Achieving_Food_and_Nutrition_Security.pdf

Macer, D. (2015). *Food Security. Encyclopedia of Global Bioethics.*

Materne, M. (2013, 12). *food securiry -definition and drivers*-. Consulté le july 2023, sur hunger explained: http://hungerexplained.org/Hungerexplained/Food_security_files/Food%20security%20-%20definitions%20and%20drivers.pdf

Nations, U. (2022). *population*. Retrieved june 20, 2023, from united nations: https://www.un.org/en/global-issues/population

NGO/CSO. (June 8 – 13, 2002.). Forum for Food Sovereignty, Official déclaration,.

Oecd. (2022). *Climate change and food systems*. Consulté le june 25, 2023, sur oecd: https://www.oecd.org/agriculture/topics/climate-change-and-food-systems/

Rahmani, M. (2020, june 30). Food Security in Algeria: Concept Review and Measurement Indicators. *Economic and Management Research Journal*, p. 238.

USAID, p. (1995, february 27). *FOOD AID AND FOOD SECURITY POLICY PAPER.* Retrieved june 24, 2023, from https://pdf.usaid.gov/pdf_docs/PNABU219.pdf

WFP. (2009). *Hunger and Markets.* Rome and Earthscan, London,: World Hunger Series, WFP.

WHO. (2021, July 12). Consulté le July 6, 2023, sur world Health Organization: https://www.who.int/news/item/12-07-2021-un-report-pandemic-year-marked-by-spike-in-world-hunger#:~:text=Overall%2C%20more%20than%202.3%20billion,as%20the%20preceding%20five%20combined.

WHO. (2022, june 7). *Safety food*. Consulté le June 26, 2023, sur World Health Organization: https://www.who.int/health-topics/food-safety#tab=tab_1