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Food security in Algeria - an analytical study

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Abstract:

Food security is one of the major challenges facing modern societies in light of ongoing economic, social, and environmental changes. This study aims to provide an assessment of the current status of food security in Algeria. This study employed a descriptive and analytical approach, systematically examining the collected data to identify the challenges and opportunities within Algeria's agricultural sector in pursuit of food security. The study concludes that, despite Algeria's substantial agricultural potential and resources, the nation continues to face food security challenges. Algeria is characterized by a persistent food deficit and an expanding food gap, underscoring the urgent need for comprehensive national policies aimed at reducing food dependency and ensuring sustainable food security.

Key Words: *food security, agricultural sector, food gap, national policies.*

JEL Classification: *L66 ، Q18*

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1. Introduction

Obtaining food has been one of the most significant challenges facing humans since the dawn of history. Since their inception, humans have sought to secure their basic needs of food, clothing, and shelter, with food at the top of their list of priorities. In our current era, food security remains a major challenge. With population growth and climate change, pressure on food resources is increasing. Many countries are striving to achieve food security, mitigate the impact of the food gap on their economies, and advance development in all its dimensions, particularly by promoting the agricultural sector and reducing food dependency.

The agricultural sector represents a fundamental source of national income, contributing not only to the provision of food and housing needs but also to employment generation and food security. Furthermore, it plays a pivotal role in reducing the national food import bill and in supporting domestic industries that rely on agricultural products as essential inputs.

– Research Problem:

By analyzing the study's background, we will attempt to answer the following main problem:
What is the reality of food security in Algeria?

- Importance of the study:

Food security is a critical issue in today's ever-changing and volatile world. It is of great interest at both the national and international levels, as food security represents an ongoing challenge for many countries and societies, affected by multiple factors such as climate change, population growth, environmental degradation, and global market fluctuations. Understanding these challenges can help develop effective strategies to maintain stable food supplies and provide adequate nutrition for the population. Furthermore, attention to food security promotes environmental and economic sustainability, reduces the food gap, and enhances social stability. As an integral part of comprehensive security.

- Study objectives:

- To examine the factors influencing the stability of national food supplies, with particular attention to changing environmental conditions and their effects on agricultural production;
- To identify deficiencies in agricultural infrastructure and food distribution systems, and to propose strategies for their enhancement to ensure sustainable and equitable food provision for the population;
- To help develop agricultural policies that promote sustainability and achieve a balance between food production, environmental protection, and strengthening the local economy;
- To assess the availability, quality, and accessibility of food across different segments of the Algerian population;
- To indetify the main challenges facing food security in Algeria.

2. The concept of food security

Food security constitutes a fundamental pillar of human well-being, ensuring universal access to adequate and nutritious food at all times. It contributes to improved public health, fosters social stability, and supports economic development. Achieving food security requires maintaining a balance between food production and consumption, while also addressing equitable access and the environmental sustainability of agricultural practices. This goal necessitates coordinated efforts among governments, the international community, and the private sector to guarantee the provision of safe, sufficient, and sustainable food for all the population segements.

2.1 Definition of Food Security:

Food security has a number of definitions, considering its close association with related concepts that ensure societal well-being.

- Linguistically, the term “Food security” comprises two components:

*** Food:** refers to the nourishment required for human growth and development, encompassing all essential nutritional elements necessary for the body's proper functioning (Group of authors, 2004).
*** Security:** refers to reassurance, freedom from fear, and trust.

Technically, food security refers to the capacity of a society to meet the basic nutritional needs of its population and to ensure the continuous fulfillment of these needs over time (Fawzia , 2010). It is characterized by the sustained availability of essential food commodities in the market. Achieving food security further necessitates the establishment of strategic food reserves to mitigate emergency risks, thereby reducing the vulnerability of developing countries to political and economic pressures exerted by developed nations that dominate global food supply chains (Nadia Ahmed , 2016).

Finaly, Food security may be defined as a state's capacity to guarantee an adequate food supply for its citizens, either through domestic production or through stable imports that are insulated from external fluctuations and risks (Razaiguia , 2015)

2.2 The importance of food security:

Food security plays a vital role in ensuring adequate nutrition for individuals, thereby improving public health and preventing disease. It also strengthens national economic stability by generating employment opportunities in agriculture and the food industries. Moreover, food security fosters social stability by reducing the likelihood of unrest associated with food shortages or rising prices. From a developmental perspective, it supports sustainability by aligning agricultural production with population needs while conserving natural resources. Achieving food security further enables countries to move toward self-sufficiency, thereby reducing dependence on imports and reinforcing food sovereignty. In addition, it ensures the availability of a diverse range of food products to meet the nutritional requirements of the population.

2.3 Objectives of achieving food security:

- Achieving food security requires sustainably increasing food production to meet the needs of a growing population.
- Diversifying food sources contributes to enhancing resilience and mitigating the negative impacts of any food crisis.
- Improving agricultural production efficiency by developing agricultural technologies and increasing resource efficiency.
- Ensuring equitable distribution by promoting a fair and efficient distribution system that ensures food access for all segments of society.
- Improving natural resource management by protecting biodiversity and conserving natural resources.
- Promoting health and nutrition through the provision of healthy foods and the improvement of dietary practices enhances public health and mitigates health issues related to malnutrition.
- Supporting scientific research and embracing innovative technologies contributes to the enhancement of production methods and the improvement of operational efficiency.
- Enhancing cooperation between countries and international institutions contributes to foster opportunities to achieve global food security.

3. Qualifications of the agricultural sector in Algeria:

Algeria's agricultural sector possesses tremendous potential, positioning it to play a pivotal role in the country's economic and social development. With vast arable land, a diverse climate, and abundant water resources, Algeria's agricultural sector is a gateway to achieving food security, creating job opportunities, and diversifying the national economy.

3.1 Agricultural land:

Algeria encompasses a vast territory of approximately 238 million hectares, making it one of the largest countries in North Africa. This land is allocated across various uses, including agriculture, forests,

pastures, and desert. According to the classification employed by the Food and Agriculture Organization (FAO) for the World Census of Agriculture, the land is distributed as follows:

- Table 01: General distribution of agricultural land in Algeria.

General distribution of agricultural land in Algeria		Space
1- Total agricultural area	1- Pastoral areas	32.75 million hectares
	2- Non-productive farm lands	2.652.454 hectares
	3 - Usable agricultural area	
	- Herbaceous crops	4.68 million hectares
	-Wasteland	2.85 million hectares
	- Tree plantations	910.322 hectares
	-Vineyards	68.649 hectares
	- Natural meadows	54.117 hectares
2 - Halfawi lands	-	2.47 million hectares
3 - Forest lands	-	4.1 million hectares
4 - Lands not intended for agriculture	-	187.6 million hectares

Source: Prepared by researchers based on data from the Agricultural Statistics, Area and Production, Series 8, 2019, p. 6.

From the table, we note that the total agricultural area amounts to approximately 44.00 million hectares, equivalent to 18.5% of the regional area. This includes pastoral areas, which are lands that have not been cultivated for at least five years and are used for animal grazing. This area amounts to 32.75 million hectares, equivalent to 74.5% of the total agricultural area. Non-productive agricultural lands include farms, buildings, yards, roads, canals, valleys, paths, etc., and their area is 2,652,454 hectares, equivalent to 6% of the total agricultural area.

Usable agricultural area includes land cultivated with various crops for at least five years, distributed as follows:

- Herbaceous crops: 4.68 million hectares, equivalent to 54.67% of the usable agricultural area.
- Idle land: 2.85 million hectares, equivalent to 33.26% of the usable agricultural area.
- Tree plantations: 910,322 hectares, equivalent to 10.63% of the usable agricultural area.
- Vineyards: 68,649 hectares, equivalent to 0.80% of the usable agricultural area.
- Natural meadows: 54,117 hectares, equivalent to 0.63% of the usable agricultural area.

Halfaouite lands account for approximately 1% of the regional territory, covering an estimated 2.47 million hectares. These areas are characterized by the natural growth of Halfa plants, which extend widely across the highlands from the Moroccan border to the Tunisian border. In comparison, forested lands represent about 1.7% of Algeria's total area, encompassing roughly 4.1 million hectares, and are composed of both forests and shrublands.

Non-arable lands, comprising areas unsuitable for agriculture or grazing—such as sand dunes, rocky terrains, residential zones, roads, and riverbeds—are estimated at 187.6 million hectares, representing 78.8% of the region's total area.

3. Water resources: Water is regarded as the essential element of life and a fundamental determinant of agricultural production and intensification. The development and expansion of the agricultural sector are closely linked to the volume of water resources mobilized and allocated for irrigation, as well as to the extension of irrigated land. Climatic conditions significantly influence the extent of such lands, particularly given that Algeria's natural water resources are limited, estimated at approximately 19 billion cubic meters annually.

- Surface water: Including rivers, valleys, springs, and dams. The amount of renewable surface water in Algeria is estimated at approximately 12.4 billion cubic meters.

- Groundwater: The present category include aquifers. The amount of renewable groundwater in Algeria is estimated at approximately 4.5 billion cubic meters.

- Seawater desalination: Seawater desalination is an alternative solution to address the water shortage in Algeria. Algeria's seawater desalination capacity is estimated at approximately 2.5 million cubic meters per day.

Approximately 70% of Algeria's water resources are allocated to agriculture, 20% to domestic consumption, and 10% to industrial use. Consequently, water scarcity represents one of the most critical challenges facing the country. Addressing this issue requires the Algerian government to promote the rationalization of water consumption, increase investment in water infrastructure, and adopt innovative technologies to enhance the efficiency and sustainability of water resource management.

3.3 Human resources working in the agricultural sector in Algeria:

Official data published by the Algerian Ministry of Agriculture in December 2021 reported a renewed rise in the number of workers employed in the agricultural sector.

- Table 2: Labor force in the agricultural sector in Algeria during the period 2015–2019.

Year	2015	2016	2017	2018	2019
Labor force in the agricultural sector	917	865	1102	1067	1083

Source: Bank of Algeria, 2021 Annual Report: Economic and Monetary Development, December 2022, p. 107. Accessed on: 05/03/2024**.**

4.The State of Food Production in Algeria:

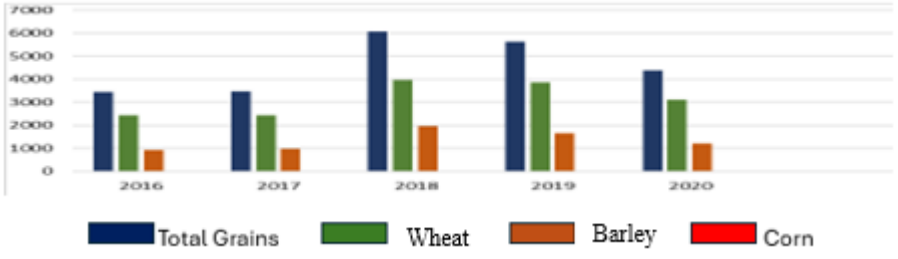
4.1 Grain Production in Algeria during the Period 2016-2020:

Grain production holds significant importance in Algeria, as grains are regarded as staple foods and constitute a major component of national consumption. Although the country possesses approximately 8.5 million hectares of agricultural land—primarily concentrated in the northern regions, which are characterized by fertile soils and relatively abundant water resources—domestic grain production remains insufficient. It meets only a limited share of national demand, thereby necessitating substantial food imports to cover the deficit.

Cereals occupy a central role in Algeria's agricultural and crop production, contributing approximately 15% of the country's total agricultural output. In terms of economic significance, cereals rank second only to red meat production. The cereal sector encompasses key crops such as durum wheat, soft wheat, barley, and yellow corn, which are among the most widely consumed food staples in Algeria.

Wheat occupies the first place among all grains in terms of cultivated area, despite competing with some other grains, most notably barley, due to its superior ability to withstand harsh climatic conditions and its ability to be grown in relatively poor soil.

Figure 1: Grain production in Algeria during the period 2016–2020 (Unit: Thousand tons).



Source: Prepared by researchers based on data from the Agricultural Statistics Yearbook - Volume 40-41.

Total Grains: The data indicate an overall increase in grain production in Algeria over the five-year period, rising from 3,445.16 tons in 2016 to 4,392.30 tons in 2020. This upward trend reflects both the country's efforts to enhance agricultural output and its commitment to strengthening food security. Nevertheless, climatic variability—particularly fluctuations in rainfall—remains a decisive factor influencing crop yields, as reduced precipitation directly leads to declines in production levels.

Wheat: Wheat production represents a substantial share of Algeria's total grain output and has recorded notable growth over the past five years, peaking at 3,981.22 thousand tons in 2018. This increase reflects governmental initiatives aimed at boosting wheat production and advancing national self-sufficiency in staple foods. Given its central role in Algerian diets, wheat is designated as a strategic crop of critical importance to food security.

Barley: Barley production in Algeria has shown a consistent upward trend over the past five years, with particularly significant increases in recent seasons. As a key agricultural crop, barley holds strategic importance, ranking second in terms of livestock feed and fodder provision. In addition, it serves as a raw material for various processing activities and food industries, thereby reinforcing its role in both agricultural sustainability and the agro-industrial sector.

Corn: The data indicate that corn production in Algeria remains relatively limited compared to wheat and barley, with output levels showing little variation and remaining consistently low over the five-year period.

Overall, the analysis of grain production data in Algeria reveals notable growth over the five-year period, underscoring the government's efforts to enhance agricultural output and advance national self-sufficiency in this vital sector.

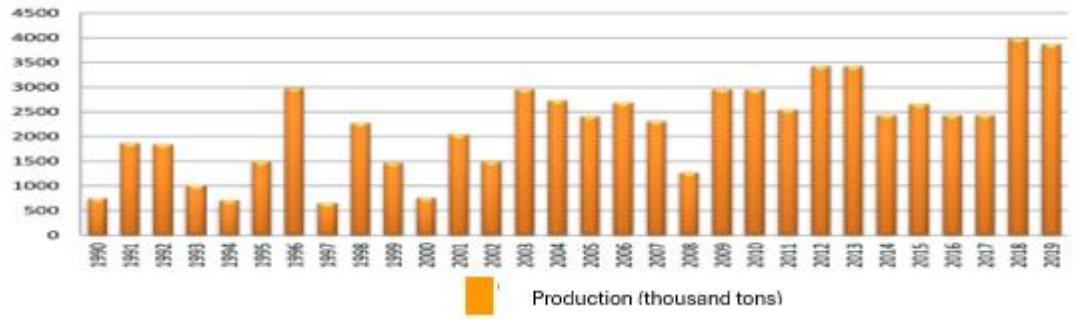
4.2 Development of wheat production in Algeria during the period 1990–2019:

Wheat production in Algeria exhibits considerable fluctuations, primarily due to climatic factors, particularly variations in rainfall. Between 1990 and 2000, production levels varied significantly, reaching a peak of 2,982.6 thousand tons in 1996 as a result of favorable climatic conditions. Conversely, the lowest output occurred in 1997, when production declined by 22.17% to 661.52 thousand tons, reflecting reduced rainfall and less favorable agricultural conditions.

Between 2001 and 2019, wheat production in Algeria experienced a substantial increase. This period coincided with the implementation of various development initiatives, beginning in 2000 and continuing through the agricultural renewal programs of 2009–2019. These programs were designed to enhance overall grain production, with a particular emphasis on wheat, in order to meet domestic demand and reduce the national food deficit.

Wheat production continued to rise steadily between 2009 and 2019, reaching a peak of 3,981.21 thousand tons in 2018.

- Figure 2: Development of wheat production in Algeria during the period 1990–2019

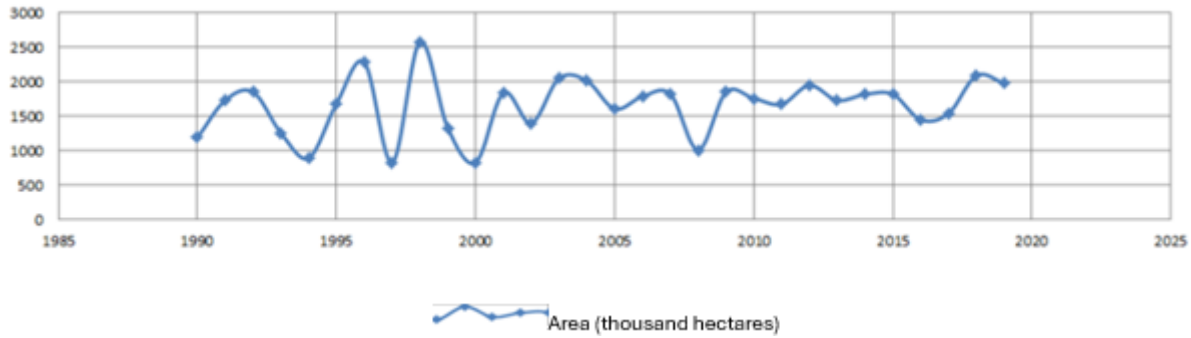


Source: Food and Agriculture Organization of the United Nations database (Unit: thousand tons) Accessed: 25/01/2024.

4.2.1 Development of wheat cultivation area in Algeria:

Algeria has designated extensive areas for wheat cultivation, particularly in the Tell region and the northern part of the steppe, where fertile soils, favorable temperatures, and adequate rainfall create suitable conditions for production.

Figure 3: The development curve of wheat cultivated area in Algeria during the period 1990–2019.



Source: FAO database www.faostat.fao.org (Unit: thousand hectares)
Accessed: 25/01/2024.

Analysis of the planting trends shows that the area sown with both hard and soft wheat doubled in 1998, reaching approximately 2,600 thousand hectares, before experiencing a sharp decline in 2000 to 870 thousand hectares. This reduction was largely due to adverse climatic conditions and insufficient rainfall, which are critical for wheat cultivation. Following the implementation of the National Plan for Agricultural and Rural Development in 2004, the area under cultivation for both wheat types increased to 2,010.69 thousand hectares.

We note a sharp decline in the cultivated area in 2008, affected by the global crisis, as the cultivated area was estimated at 1,006.67 thousand hectares, then rose again during the period 2009-2015, reaching 1,712.34 thousand hectares in 2012. As for the years 2016 and 2017, we note a decline in the cultivated area to 1,448.05 and 1,537.33 thousand hectares, while we note an increase in the cultivated area of wheat to reach 2,087.03 and 1,974.98 thousand hectares during the years 2018 and 2019, respectively.

4.2.2 Agricultural Product Production in Algeria during the period 2016-2020:

-Potatoes: Potato production declined slightly in 2020 compared to previous years, reaching 4,659.48 tons compared to 5,020.25 tons in 2019. This decline could be due to factors such as unfavorable weather conditions or changes in agricultural practices.

- Legumes: Legume production has shown a gradual increase over the five years, increasing from 77.31 in 2016 to 115.05 in 2020. This increase may be due to increased demand for legumes due to their high nutritional value and health benefits.

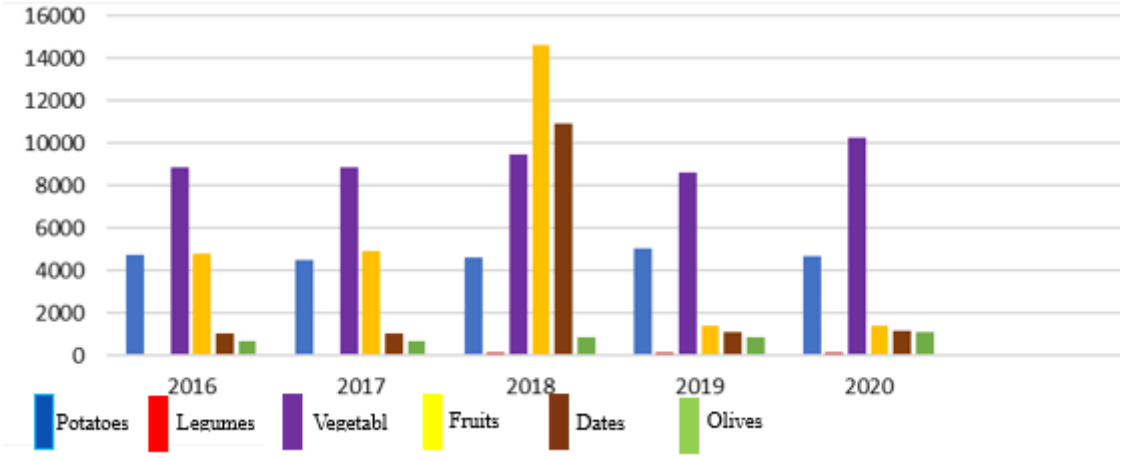
- Vegetables: Vegetable production has varied over the five years, but overall, there is a slight increase in production in 2020 compared to previous years.

- Fruits: It appears that there was a sharp decline in fruit production in 2020 compared to previous years, with quantities declining to 1,435.82 tons compared to 14,634.71 tons in 2018. This decrease could be due to factors such as adverse weather conditions or production problems.

- Dates: It appears that date production has been volatile over the five years, with slight changes in the quantities produced.

- Olives: Olive production in Algeria declined in 2020 following a steady increase over the preceding three years. Olive cultivation is among the most significant fruit tree crops in the country. Olives are valued not only as a staple food but also for the by-products of olive oil, which serve as high-quality livestock fodder and as raw materials in the soap and cosmetics industries.

- Figure 4: Agricultural Product Production in Algeria during the period 2016-2020.



Source: Prepared by researchers based on data from the Agricultural Statistics Yearbook - Volume 40-41. (Unit: Thousand Tons)

4.2.4 Livestock production in Algeria during the period 2015-2020:

Total Livestock: Figure 7 highlisht a slight increase in total livestock over the four years, rising from 35,599.38 in 2017 to 37,989.13 in 2020. This increase generally reflects increased livestock production during the period.

Cows: The graph indicates a slight decline in cattle numbers, decreasing from 2,150 heads in 2015 to 1,740.8 heads in 2020. This represents a reduction of 25.61%, with minor fluctuations observed in the recorded figures over the period.

Sheep: The data reveal a steady increase in the number of sheep over the past six years, rising from 28,112 heads in 2015 to 30,905.56 heads in 2020, representing an overall growth of 10.01%. This upward trend is largely attributable to the increasing demand for sheep meat and related products.

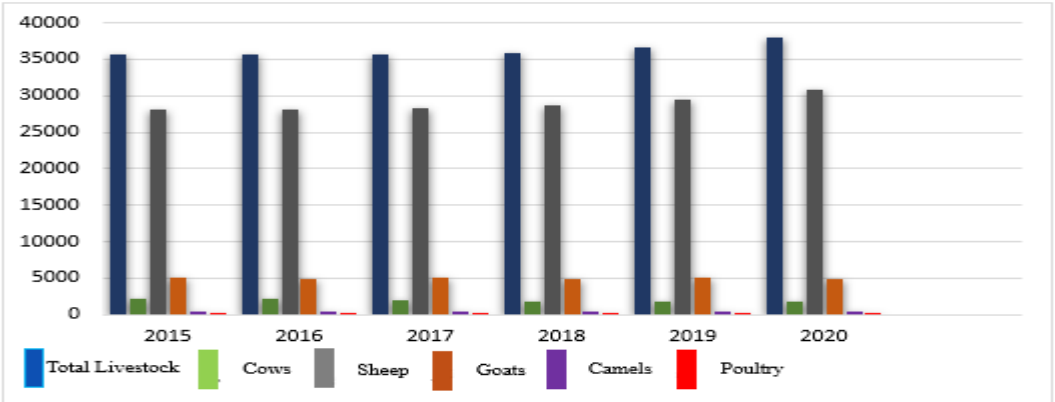
Goats: In contrast, goat numbers experienced a slight decline over the same period. Although production peaked in 2018 at 28,723.99 heads, the population decreased from 5,013.95 heads in 2015 to 4,908.17 heads in 2020, marking a decline of 2.10%. This relative stability may be explained by factors such as nutritional constraints and the expansion of targeted investments within the sector.

Camels: The camel population remained generally stable, with minor fluctuations, increasing from 362.27 heads in 2015 to 435.21 heads in 2020, an overall rise of 20.14%.

Poultry: Chicken production in Algeria remains comparatively low relative to other livestock categories, reaching 137.28 million birds in 2020.

Overall, the analysis indicates that Algeria's livestock sector demonstrates relative stability, with moderate variations across animal categories. Sheep production, however, clearly dominates the sector, representing the most significant component of animal husbandry.

- Figure 5: Livestock production in Algeria during the period 2015-2020.



Source: Prepared by researchers based on data from the Agricultural Statistics Yearbook - Volumes 38-40-41. (Unit: Thousand head)

5. The food gap in Algeria:

5.1Algeria's food bill during the period 2000–2022:

The below table highlight an increase in the value of the food bill during the period from 2000 to 2022, reaching a peak of $10.7 billion in 2022. This food expenditure is a complex result of several factors: The first factor refers to a food import policy that has been a major means of supplying the domestic market, to the point that it has made Algeria one of the most important players in global markets (the sixth largest global importer of grains and the second largest importer of milk powder after China).

The second factor concerns food security, which is closely linked to household purchasing power, determined by annual family income and reinforced by Algeria's long-standing policy of subsidizing basic commodities. Essential products such as wheat, dried vegetables, milk, sugar, and edible oils are subsidized to maintain affordability. Although the subsidy reform outlined in the 2022 Finance Law was postponed due to increased external revenues from rising global oil and gas prices—Algeria's principal exports—the prices of bread, semolina, and pasta have remained relatively stable over the past two years despite global wheat price fluctuations. Consequently, these food subsidies continue to mitigate food inequalities and strengthen food security for households most vulnerable to rising costs.

Algeria has doubled its per capita food production, while undernourishment has decreased from 8% of the population to less than 3%, the lowest rate in Africa.

Table 3: Value of Algeria's food bill during the period 2000–2022. Unit: Billion US dollars

Year	2000-2005	2006-2010	2011-2015	2016-2020	2022-2021
Invoice value	1.7	4.2	9.5	8.4	10.7

Source: Siyada website https://www.siyada.org/ Unit: Billion US dollars, Accessed: 25/02/2024

5.2 Algeria's total agricultural and food imports during the period 2015–2020.

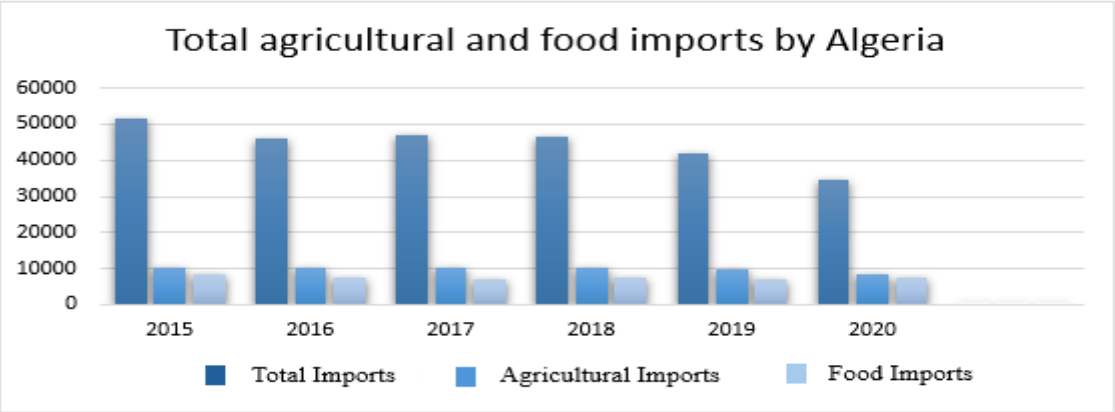
Total Imports: Data indicate a notable decline in Algeria's total imports over recent years, decreasing from 47,089.47 in 2017 to 34,665.40 in 2020—a reduction of 26.87% compared to 2017. This downward trend may be attributed to multiple factors, including shifts in trade policies, fluctuations in global markets, and changes in domestic demand.

Agricultural Imports: Agricultural imports have followed a similar trajectory, registering a decrease from $10,332.15 in 2017 to $8,462.32 in 2020, representing an 18.09% reduction relative to 2017. This decline reflects government initiatives aimed at enhancing self-sufficiency and promoting reliance on domestic resources.

Food Imports: Food imports, which comprise essential consumer items such as prepared foods and basic food ingredients, also declined during the same period, falling by 4.32% compared to 2017. This decrease is largely associated with state policies designed to strengthen domestic production and reduce dependency on external suppliers.

Taken together, the decline in total, agricultural, and food imports over the past six years suggests the effectiveness of government strategies focused on achieving greater self-sufficiency and limiting reliance on foreign imports in the agricultural and food sectors.

- Figure 6: Algeria's total agricultural and food imports during the period 2015–2020.



Source: Prepared by researchers based on data from the Agricultural Statistics Yearbook, Volumes 38-40-41.

5.2.1 Developments in wheat imports in Algeria:

Algeria faces a structural deficit in wheat production and consequently relies heavily on imports to satisfy domestic demand, with approximately 60% of national wheat consumption sourced from abroad. Overall, wheat imports exhibited an upward trend between 1985 and 2020, rising from 1.5 million tons in 1985 to 8.4 million tons in 2020. However, this period was also marked by considerable annual fluctuations. For instance, imports rose sharply from 4.3 million tons in 1990 to 6.8 million tons in 1991. This is due to several factors, including:

Several factors have influenced wheat import trends in Algeria between 1985 and 2020. Including the following concerns :

Weather conditions played a decisive role, as domestic production is highly sensitive to climatic variability. For instance, the drought of 1991 led to a sharp decline in local output, which in turn necessitated a substantial increase in imports.

Population growth also contributed to rising demand, as Algeria's steadily expanding population over this period intensified pressure on national wheat supplies.

Government policies significantly shaped import dynamics. In 1991, for example, the removal of wheat subsidies resulted in higher domestic prices, which further stimulated reliance on imports

Figure 7: The evolution curve of wheat imports in Algeria during the period 1990-2019.



Source: FAO database www.faostat.fao.org (Unit: thousand tons) ,Accessed: 29/01/2024.

5.2.2 Food Imports in Algeria from 2015 to 2020:

Food imports constitute a significant proportion of Algerian imports due to the import of large quantities of food products, especially widely consumed items such as grains, sugar, etc.

We analyze Algeria's food imports from 2015 to 2020, focusing on key products such as wheat, barley, potatoes, sugar, legumes, vegetables, and fruits. The total value of food imports saw a downward trend during the period under review, declining from $8,297.22 million in 2015 to $7,601.12 million in 2020.

- Wheat: Wheat was the most imported commodity in all years listed, with the value of wheat imports ranging from $1,843.75 million in 2015 to $1,614.36 million in 2020. Wheat imports have declined significantly in recent years, from 8,504.85 thousand tons in 2015 to 6,665.68 thousand tons in 2020. This decline may reflect increased domestic production, especially during the COVID-19 pandemic.

- Barley: Barley imports have fluctuated over the past few years, increasing in 2020 compared to the previous year. This increase could be due to increased domestic demand or a decrease in domestic production.

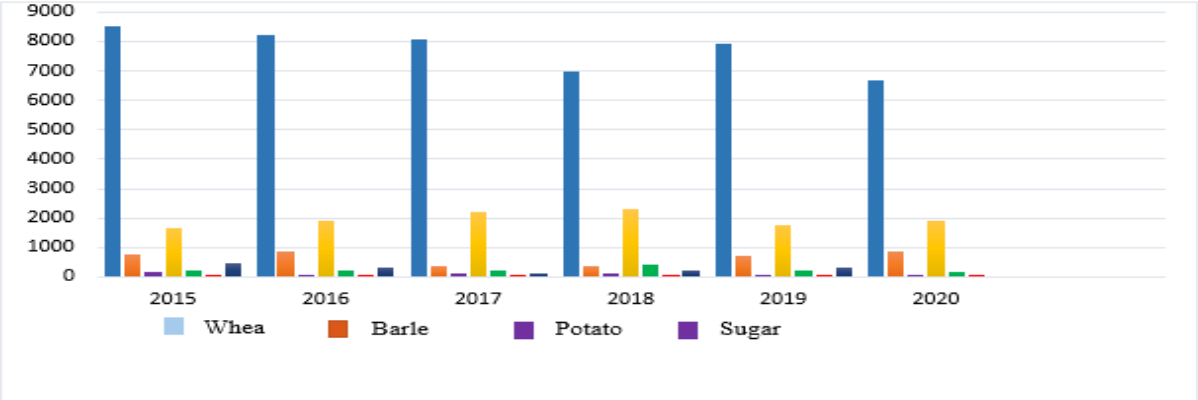
- Potatoes: Potato imports have declined significantly since 2018, which could indicate increased domestic production or improved domestic supplies.

- Sugar: Sugar imports have declined significantly in recent years, possibly due to increased domestic sugar production or improved supplies.

- Legumes, vegetables, and fruits: Data on import volumes for some years for these products is not recorded, but available data suggests that import volumes for these products may fluctuate over the years.

The observed trends in Algeria's food imports can be attributed to several interrelated factors. Steady population growth during the period under review has contributed to rising food demand. Import levels for certain products, such as potatoes and grains, have also been influenced by fluctuations in domestic production as well as volatility in global food prices, both of which have significantly shaped import volumes. Furthermore, the COVID-19 pandemic disrupted local supply chains, thereby increasing reliance on imports, particularly for fruits and vegetables.

Figure 8: Algeria's food imports for the period 2015–2020.



Source: Prepared by researchers based on data from the Agricultural Statistics Yearbook, Volumes 38-40-41 (Unit: Thousand tons).

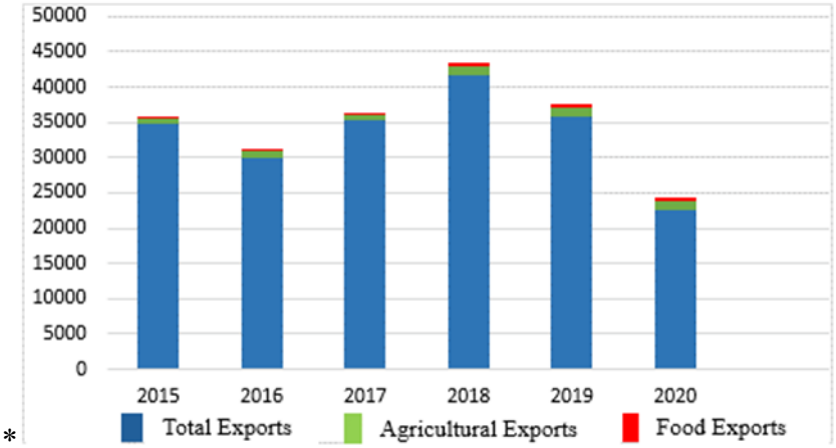
5.3 Algeria's total agricultural and food exports during the period 2015–2020:

Figure 11 presents data on Algeria's total exports, agricultural exports, and food exports between 2015 and 2020.

- **Total Exports:** The value of total exports declined from $34,796 million in 2015 to $22,483.1 million in 2020, representing a 37.1% decrease compared to 2019. This reflects an overall contraction in export volumes during the period.
- **Agricultural Exports:** Agricultural exports increased from $648.1 million in 2015 to $1,404.6 million in 2020, reflecting an 8.1% rise and indicating steady growth in this sector.
- **Food Exports:** Food exports grew from $221.3 million in 2015 to $477.6 million in 2020, an increase of 21.3%, highlighting notable progress in this segment.

The sharp decline in Algeria's total exports in 2020 can be attributed to the global economic slowdown caused by the COVID-19 pandemic, which significantly reduced international demand for goods and services. Despite this downturn, agricultural and food exports recorded modest increases in 2020, supported by heightened demand for essential food products during the crisis. Nevertheless, agricultural and food exports continue to represent only a small share of Algeria's overall exports, suggesting considerable potential for future expansion in these sectors

- Figure 09: Algeria's total agricultural and food exports during the period 2015–2020.



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Source: Prepared by researchers based on data from the Agricultural Statistics Yearbook, Volumes 38-40-41 (Unit: Million US dollars).

5.4 – Algeria's agricultural trade balance during the period 2001–2017:

The seven product categories illustrated in Figure 12 accounted for nearly 80% of Algeria's agricultural imports in 2017. This structure demonstrates the country's strong dependence on international markets—particularly European suppliers—to secure essential food products for its expanding population. In that year, Algeria's food import bill for cereals, sugar, vegetable oils, and dairy products alone exceeded $6 billion, underscoring the persistent burden of food dependency on the national trade balance

- Cereals: Cereal production holds a central place in Algeria due to both its cultural significance and its role as a staple in the national diet. Despite this importance, domestic production has not reached the desired level and continues to meet only a fraction of national demand. Cereals also occupy a strategic position within the national economy, consistently accounting for an annual average of 40% of the total utilized agricultural area during the periods 2001–2009 and 2010–2017. The cultivated area averaged approximately 3,200,930 hectares in 2001–2009, with durum wheat and barley representing nearly 74% of this land. During 2010–2017, the average cereal area increased slightly to 3,385,560 hectares, reflecting a 6% growth compared to the previous decade.

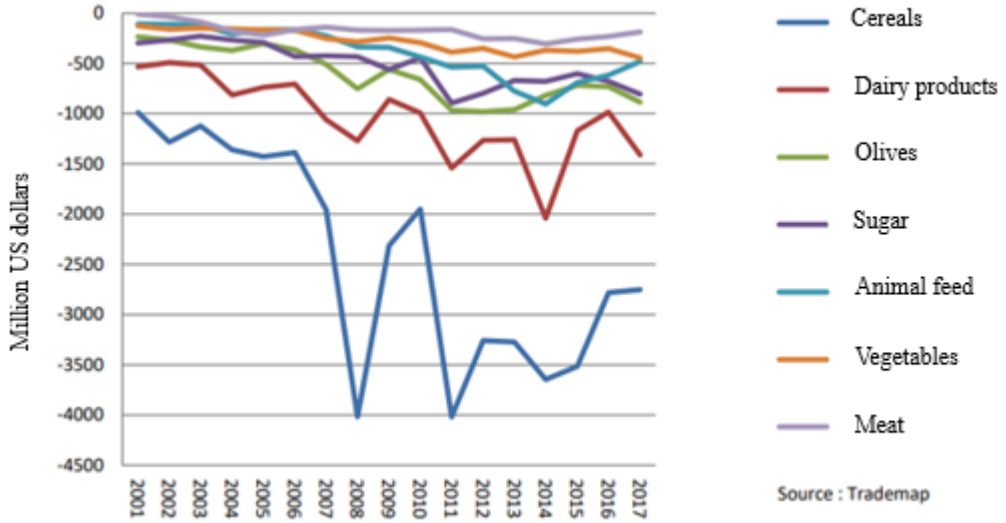
This represents an increase of 6% compared to the period 2001–2009. Average cereal production during 2010–2017 is estimated at 41.2 million quintals, marking a 26% rise from the 32.6 million quintals recorded in the previous decade. Production was dominated by durum wheat and barley, which accounted for 51% and 29% of total output, respectively, during 2010–2017..

In 2017, Algeria's trade deficit in agricultural products was particularly significant, amounting to $4.8 billion. Cereals represented the largest share of imports, with soft wheat alone costing $2.7 billion, followed by corn at $1.1 billion and durum wheat at $500 million. Despite these high import levels, national cereal production reached 63 million quintals in 2017, although this figure was lower than the 72 million quintals recorded in 2016.

Meat imports also made a significant contribution to Algeria's trade deficit, totaling $1.6 billion in 2017. Beef represented the largest share at $800 million, followed by poultry ($400 million) and sheep and goat meat ($300 million). Domestic meat production showed a modest increase, rising from 1.1 million tons in 2016 to 1.2 million tons in 2017.

Other major agricultural imports included dairy products ($1.2 billion), vegetable oils ($800 million), and sugar ($600 million), reflecting continued reliance on imported essential food products to meet national demand.

Figure 10: Algerian agricultural trade balance curve by product during the period 2001–2017.
Unit: Million US dollars



- Source: Brief Report on Agriculture in Algeria, p. 79.

6. Development of the food gap in Algeria during the period 2015–2020:

Table 4: Development of the food gap in Algeria during the period 2015–2020.

year	Total exports	Food exports	Agricultural exports	Total imports	Agricultural imports	Food imports	total gap	Agricultural gap	Food gap
2015	34796	221,3	648.1	51803.1	10247.8	8297.2	-17007.1	-9599.7	-8075.9
2016	30027,6	349,1	867.3	46059.2	10309.1	7603	-16031.6	-9441.8	-7253.9
2017	35191,1	328,3	756.8	47089,47	10332.15	7212,10	-11898.37	-9575.35	- 6792.8
2018	41797,3	342,9	1239.4	46333,1	10306	7385,9	-4535.8	-9066.6	-7043
2019	35823,5	410,6	1299.8	41934,12	9682.3	6925,9	-6110.62	-8382.5	-6515.3
2020	22483,1	477,6	1404.6	34665,40	8462.32	7601,12	-12182.3	-7.057.72	-7123.52

Source: Prepared by researchers based on: The Arab Organization for Agricultural Development's Yearbook of Agricultural Statistics, Volumes 38, 40, 41 (Unit: Billion US dollars).

The table above indicates that Algeria's total exports have fluctuated over the study period, experiencing a notable increase in 2018 when their value rose to $41,797 million. In contrast, food exports demonstrated a steady upward trend, reaching a peak of $477.6 million in 2020. This growth reflects both the adoption of export facilitation measures and the rising global demand for specific Algerian food products, such as fruits and vegetables, which enabled the value of food exports to double between 2015 and 2020. Despite this progress, food exports accounted for only 2.12% of total exports at their highest level in 2020, underscoring the limited capacity of domestic production to generate a surplus and highlighting the continued need for substantial food imports.

Total imports also exhibited fluctuations, reaching $34,665.4 million in 2020. Agricultural imports peaked at $10,332.5 million in 2017 and declined to $8,462.32 million in subsequent years. Food imports showed a gradual decrease, from $8,297.2 million in 2015 to $7,901.12 million in 2020.

This decline can be attributed to increased domestic food production and government policies aimed at reducing imports to support local production.

- Food Gap:

The food deficit in Algeria increased substantially over the period under review, rising from -$7,253.9 million in 2015 to -$12,182.3 million in 2020. Analysis of the agricultural trade balance further highlights that, in each of the six years studied, the value of agricultural imports consistently exceeded that of agricultural exports, indicating a persistent trade deficit in the sector. The average agricultural gap during this period was approximately $8,853.94 million, demonstrating that imports were, on average, significantly higher than exports.

Despite this, the overall trade deficit showed a slight decline during the analyzed period, decreasing from -$17,007.1 million in 2015 to -$6,110.62 million in 2019. Several factors contributed to this reduction, including rising oil prices, which increased revenues for Algeria as an oil-exporting country and enhanced its capacity to finance imports, including food. Additionally, efforts toward export diversification helped reduce reliance on oil and gas revenues, contributing to improved trade balance resilience.

7.Proposed Strategies for Achieving Sustainable Food Security in Algeria

7.1 Policies for Achieving Food Security in Algeria

7.1.1 Food Production Development Policy:

Algeria's food deficit cannot be resolved through continued reliance on imports, which pose risks to national sovereignty. Instead, addressing this challenge requires leveraging domestic production capacities and implementing a comprehensive strategy aimed at achieving food self-sufficiency. Such a strategy should prioritize sustainable agricultural development and be grounded in a clear understanding of the underlying causes of the country's food security challenges. Achieving this objective depends on the effective integration of the following key elements :

- **Enhancing Agricultural Production:** Support and expand agricultural output both quantitatively and qualitatively through farmer financing, improved agricultural infrastructure, and investment in scientific research and development to better meet consumer needs.
- **Promoting Agricultural Investment:** Encourage private and public investment in the sector by improving the investment climate and offering targeted incentives to investors.
- **Diversifying Food Sources:** Foster the cultivation of non-traditional crops and the development of animal husbandry to reduce dependence on a limited range of food products.
- **Reducing Food Loss:** Minimize post-harvest losses by improving transportation, storage systems, and public awareness of the importance of reducing food waste.
- **Supporting Vulnerable Populations:** Implement cash transfer programs and food security initiatives to protect low-income households.
- **Developing Infrastructure:** Establish and enhance public infrastructure projects, including markets, roads, transportation networks, cold storage facilities, wells, and dams, while promoting the expansion of arable land.
- **Protecting National Production:** Exempt essential agricultural inputs from customs duties and provide customs protection for selected domestic products that achieve defined levels of self-sufficiency.

7.1.2 Price stabilization policy:

The state strives to ensure year-round access to essential food commodities for low-income households without adversely affecting market prices, through mechanisms such as direct subsidies or price caps. Additionally, it seeks to stabilize food prices by maintaining a strategic food reserve. Determining the optimal quantities of these reserves is a critical component of this strategy, which can be achieved through the following measures:

A. Achieving Food Price Stability

- **Direct Support:** The state provides financial assistance to low-income households to purchase essential food commodities—such as wheat, rice, sugar, and oils—at reduced prices. This support can be delivered through ration cards, vouchers, or direct cash transfers.
- **Capped Prices:** Maximum prices are set for selected basic food commodities to prevent excessive price increases by merchants.

B. Stabilizing Food Prices

- **Strategic Stocks:** The state maintains reserves of key food commodities to mitigate shortages or sudden price spikes. During periods of rising prices, the government can release commodities from these reserves, while in times of oversupply, it may purchase surplus production to stabilize the market.

C. Determining Optimal Quantities of Food Stocks

- **Demand Analysis:** Study and analyze consumption data to understand market needs and estimate the quantities required to meet demand during crises.
- **Supply Analysis:** Monitor domestic production, import, and export data to assess available quantities and anticipate potential shortages.
- **External Factors:** Consider events such as natural disasters, political instability, or global market fluctuations that may affect food availability.

D. Ensuring the Sustainability of the Price Rationing Strategy

- **Resource Efficiency:** Optimize resource use in implementing price controls, minimizing waste and preventing corruption.
- **Equitable Distribution:** Ensure fair allocation of food commodities to all citizens, prioritizing vulnerable groups.
- **Integration with Agricultural Development:** Align price rationing programs with agricultural development initiatives to promote long-term food self-sufficiency.

7.1.3 Food Rationalization Policy: This policy is implemented through the regulation of agricultural production according to available resources and national food needs, while adhering to international standards, with the overarching goal of achieving food security. Key objectives of this approach include:

- **Modifying Consumption Patterns:** Discouraging irrational consumption habits by increasing the cost of non-essential or excessive consumption.
- **Rationalizing Food Subsidies:** Targeting subsidies exclusively to essential goods and directing them toward low-income populations.
- **Rationalizing Food Imports:** Limiting imports to essential items that are unavailable or insufficiently produced locally. Imports are managed in measured quantities, with prices and quality controlled to ensure accessibility and affordability for consumers.
- **Raising Awareness:** Implementing educational programs to encourage responsible consumption and promote sustainable behavioral practices within the community.
- **Taxing Luxury Goods:** Imposing higher taxes on luxury food items to reduce unnecessary consumption and generate revenue for essential food programs..

8.Challenges to Achieving Food Security

Achieving food security in Algeria is confronted with multiple challenges, encompassing both short-term and long-term dimensions. These challenges include:

8.1 Climate Challenges:

- **Recurrent Drought:** Algeria experiences frequent droughts, which significantly reduce agricultural productivity and threaten food security.
- **Desertification:** The expansion of desert areas diminishes the land available for cultivation, pastures, and forests, posing a major risk to agricultural sustainability.
- **Land Degradation:** Vast areas of agricultural land have already been lost or are under severe threat due to soil erosion, salinization, and other forms of degradation.
- **Climate Change:** Rising temperatures and shifting rainfall patterns further exacerbate the challenges of agricultural production, making it increasingly difficult to maintain consistent yields.

8.2 - Economic Challenges:

- **Dependence on Food Imports:** Algeria relies heavily on imports of cereals and vegetable oils to meet domestic demand, making the country vulnerable to fluctuations in global prices.
- **Insufficient Agricultural Investment:** Low investment in agriculture and limited development of agricultural resources result in reduced productivity and inadequate infrastructure.
- **Rapid Population Growth:** The country's rapidly increasing population intensifies demand for food, placing additional pressure on domestic production systems.

8.3- Social Challenges:

- **Limited Nutritional Awareness:** Many Algerians lack sufficient knowledge about the importance of a balanced and healthy diet, contributing to widespread malnutrition.
- **Food Waste:** Significant quantities of food are lost or wasted, particularly at the household and restaurant levels, reducing overall food availability.
- **Poverty:** A segment of the population lives in poverty, limiting their ability to access and purchase adequate food, thereby exacerbating food insecurity.

8.4 - Institutional Challenges:

- **Poor Stakeholder Coordination:** Algeria lacks a comprehensive national food security strategy, resulting in overlapping initiatives and insufficient coordination among relevant stakeholders.
- **Bureaucratic Constraints:** Administrative inefficiencies hinder the effective implementation of programs and projects aimed at enhancing food security.
- **Corruption:** Corruption further undermines the development and execution of food security initiatives, reducing their effectiveness and impact.

Addressing food security in Algeria requires a comprehensive approach that integrates current challenges with the principles of sustainable development. This necessitates adopting integrated strategies that balance agricultural production with the conservation of natural resources, while also raising awareness among farmers and consumers about the importance of sustainability.

9. Conclusion

This study highlights the persistent challenges facing Algeria's food security. The country remains heavily dependent on imports, with significant deficits in the production of essential commodities such as wheat, sugar, and rice, resulting in a widening food and agricultural gap. Despite the country's abundant natural, human, and material resources, the agricultural sector continues to struggle to achieve self-sufficiency.

Recent improvements, such as an 8.4% increase in Algeria's Global Food Security Index in 2022 (reaching 58.9), indicate progress, yet the level remains insufficient to ensure comprehensive food security. Key areas of development include disaster risk management and the adoption of pest and disease mitigation practices, which enhance resilience and reduce the economic and social impacts of natural and human-made hazards. Effective coordination between local and national authorities further strengthens the country's adaptive capacity.

Although government policies targeting food security and poverty reduction have achieved measurable results, they remain below expectations. Achieving sustainable food security in Algeria will require integrated strategies that strengthen domestic agricultural production, optimize resource use, and promote long-term resilience, while reducing dependence on imports. These findings underscore the urgent need for a holistic and coordinated approach to address structural challenges and secure food sovereignty.

-Suggestions and Recommendations:

To strengthen food security and capitalize on opportunities in global agricultural markets, Algeria should consider the following measures:

- **Expanding Agricultural Exports:** Leverage the rising global demand for agricultural and food products by increasing export volumes. This can be achieved through improvements in

agricultural productivity, product quality, and the development of storage and transportation infrastructure.

- **Market Development:** Promote Algerian agricultural products in international markets and cultivate trade relations with foreign partners to enhance export potential.
- **Farmer Support:** Provide financial and technical assistance to farmers to increase productivity and implement sustainable agricultural practices.
- **Scientific Research and Innovation:** Support agricultural research to develop technologies that enhance productivity, improve product quality, and protect the environment.
- **Infrastructure Development:** Improve rural infrastructure, including roads, water supply, and electricity, to facilitate the transportation, storage, and marketing of agricultural products.
- **Public Awareness:** Raise awareness across society regarding the critical role of agriculture in achieving sustainable development and food security.
- **Stakeholder Coordination:** Strengthen coordination among government agencies, private sector actors, and other stakeholders to ensure effective implementation of the national food security strategy.
- **Water Resource Management:** Promote modern irrigation techniques, including efficient sprinkler systems, to improve water use efficiency in agriculture.
- **Sustainable Agricultural Policies:** Develop comprehensive policies that encourage sustainable agricultural practices while reducing reliance on agrochemicals.
- **Good Governance:** Combat corruption to ensure fair and efficient distribution of agricultural resources and prevent market distortions.
- **Market Regulation:** Prevent monopolistic practices among traders to avoid price manipulation and ensure equitable access to essential food commodities

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