

Towards Sustainable Food Security in Algeria: Theoretical Foundations and Strategic Approaches within Vision 2030

Boudali Belkacem ⁽¹⁾, Bouarfa Oussama ⁽²⁾

¹ Professor Lecturer Class A, Laboratory of Modern Economics and Sustainable Development, University of Tissemsilt (Algeria) , prof.boudali.belkacem@gmail.com

² PhD student, Laboratory of Industrial Development, Organizational Development, and Innovation, University of Tissemsilt (Algeria), bouarfa.oussama@univ-tissemsilt.dz

ARTICLE INFORMATION

Original Research Paper

Received: 25/10/2025

Accepted: 08/02/2026.

Published: 21/03/2026

Keywords:

Keyword.1: Food Security

Keyword.2: Agriculture

Keyword.3: Rural Farming

Keyword.4: Water security

Keyword.5: Algeria

JEL Classification Codes: Q18, Q01, Q15 , Q25,O55

The **abstract**: Food security in Algeria faces multiple challenges encompassing economic, social, and political dimensions. Food security policies have become a national priority, receiving significant attention from both the government and civil society. These policies aim to ensure the availability of sufficient, high-quality food at affordable prices for all social groups. Furthermore, the National Food Security Strategy, within the framework of Vision 2030, seeks to achieve a set of clearly defined objectives, spanning both the short and long term, reflecting the state's commitment to enhancing the sustainability of the national food system.

Mots clés:

Mot clé.1: Sécurité alimentaire

Mot clé.2: Agriculture

Mot clé.3: Agriculture rurale

Mot clé.4: Sécurité hydrique

Mot clé.5: Algérie.

Codes de classification JEL: Q18, Q01, Q15 , Q25,O55

Le résumé La sécurité alimentaire en Algérie fait face à de multiples défis englobant des dimensions économiques, sociales et politiques. Les politiques de sécurité alimentaire sont devenues une priorité nationale, recevant une attention particulière de la part du gouvernement ainsi que de la société civile. Ces politiques visent à garantir la disponibilité d'une nourriture suffisante, de qualité et à des prix abordables pour toutes les catégories sociales. En outre, la Stratégie nationale de sécurité alimentaire, dans le cadre de la Vision 2030, cherche à atteindre un ensemble d'objectifs clairement définis, à court et à long terme, reflétant l'engagement de l'État à renforcer la durabilité du système alimentaire national.

Boudali Belkacem

Email: prof.boudali.belkacem@gmail.com

1- The introduction:

The issue of food security has become a pressing national concern for Algeria, driven by the impacts of urbanization and globalization, as well as the consequences of climate change and persistent fluctuations in global prices. The COVID-19 pandemic further highlighted the strategic importance of food security and its central role in addressing crises. Consequently, the need to develop a comprehensive strategy for achieving food security has become an imperative that cannot be overlooked. The formulation and implementation of this strategy present both opportunities and challenges, not only for the Algerian government but also for local and international partners supporting Algeria's efforts to enhance its resilience against crises and mitigate the effects of economic slowdown.

Achieving food security is a prerequisite for ensuring human security and national stability. It also contributes to sustainable development, reinforcing Algeria's position as a pillar of stability and peace in the region. Despite Algeria's significant reliance on local agricultural production as a primary source of food security, the concept extends beyond agriculture to encompass a multifaceted sector. Food security necessitates enhanced collaboration among various institutions and stakeholders, including public and private sectors, civil society organizations, and international entities, to work collectively toward achieving its objectives.

Food security requires the integration of several interconnected factors, including nutrition, consumption patterns, access to food, governance, stability, and sustainability. Based on this, the primary research question can be formulated as follows: **What are the key food security policies in Algeria and the national strategy outlined to achieve the objectives of Vision 2030?** To address this research question and explore the topic, this study adopts a descriptive approach through the analysis of the following axes:

2- The theoretical frame work of food security

The concept of food security emerged around 45 years ago in response to global food crises. Initially, the primary concern was ensuring sufficient food supply, with a focus on availability and price stability at both global and local levels. This urgency stemmed from the extreme price fluctuations

of agricultural commodities in the early 1970s, a period marked by disruptions in currency and energy markets, among other challenges. The emphasis on supply-side factors reflected shifts in the global food economy, which was seen as a key contributor to these crises. The persistence of famine, hunger, and food-related emergencies led to a broader redefinition of food security, incorporating the needs and behaviors of vulnerable populations most affected by these challenges.

2.1. The Concept of Food Security

The concept of food security was officially articulated during the 1974 World Food Conference, where it was defined as the continuous accessibility of sufficient global reserves of essential food commodities. This definition emphasized the necessity of maintaining a stable increase in food consumption while mitigating the impact of variations in both production levels and market prices. (Nations, Report of the World Food Conference, 1975) , Food security is achieved when every individual, at any given time, has both physical and financial means to obtain an adequate supply of safe and nourishing food that aligns with their nutritional requirements and personal dietary choices, ensuring a healthy and active lifestyle. (FAO, 1996) , WFP offers the following definition “A condition that exists when all people, at all times, are free from hunger” (WFP, 2009), In the Islamic framework, food security is understood as guaranteeing a consistent provision of halal sustenance that meets the customary consumption needs of society over a specified period (Mohammed, 2000)

Based on the aforementioned definitions, food security can be understood as a term that refers to the availability of sufficient and quality food at affordable prices for all. It represents one of the most critical goals pursued by nations.

2.2. The Pillars of Food Security

Food security is structured around four fundamental pillars, commonly referred to as the Four Dimensions of Food Security. These core elements, derived from the World Food Summit (WFS) definition, serve as a valuable framework for analyzing and assessing food security conditions.

Table No. 01: Dimensions of Food Security

Availability	The World Food Summit (WFS) definition highlights the concept of "sufficiency," emphasizing food availability. The World Food Programme (WFP) defines availability as the total food accessible within a country or region, sourced from domestic production, imports, reserves, and aid. This includes net commercial imports after deducting exports and applies at all levels, from national to household. Earlier WFP definitions also considered cross-border trade, which remains relevant. Although the FAO Founding Conference identified poverty as the main driver of hunger and malnutrition, historical perspectives often equated food security solely with sustained food availability.
Access	The World Food Summit (WFS) defines access as the ability to obtain food through physical, economic, and social means. Although Amartya Sen introduced this concept in the early 1980s, its significance as a core element of food security remains debated. Crises such as the 2005 Niger famine and the 2008 surge in global food prices have shifted attention primarily to its economic dimension. The World Food Programme (WFP) describes access as a household's capacity to secure sufficient food through various means, including purchases, barter, borrowing, aid, or gifts. It consists of three key aspects: physical, economic, and socio-cultural access.
The Utilization Dimension	which the World Food Summit (WFS) defines as ensuring " Wholesome and secure food that fulfills nutritional requirementsAvailability and access alone do not ensure a balanced diet; effective utilization depends on proper selection, storage, preparation, and nutrient absorption. Food quality and safety play a vital role, influenced by dietary practices, knowledge, and external disruptions affecting supply chains. Additionally, while food safety is essential, it has traditionally received greater attention in developed nations. Linguistic distinctions, such as the conflation of food safety and food security in French and Italian, have sometimes caused confusion, further underscoring the need for clear integration of food safety into broader food security discussions.

The Stability	Stability, the fourth pillar of food security, is defined by the World Food Summit (WFS) as maintaining food security “at all times.” It supports availability, access, and utilization, highlighting the importance of ensuring consistent and long-term food security rather than a temporary or seasonal state. Stability differentiates various forms of food insecurity: • Chronic food insecurity is a prolonged inability to secure essential nutrition. • Transitory food insecurity arises temporarily due to sudden shocks or disruptions. • Cyclical food insecurity occurs periodically, often linked to seasonal patterns such as harvest cycles. This dimension highlights the importance of building resilience and sustainability into food systems to prevent both short-term disruptions and long-term deficiencies.
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Source: Prepared by the researchers based on (Simon, 2012)

Ensuring food security requires addressing all four dimensions simultaneously. However, the 1996 World Food Summit definition introduces an additional factor: “**food preferences for an active and healthy life.**” This aspect, linked to individual and household choices, merits further examination. At the micro level, it reflects personal and cultural dietary needs, paralleling the concept of food sovereignty at the national level by emphasizing the alignment of food access and availability with dietary traditions and preferences.

2.3. Food Security Objectives

Food security is a critical aspect of sustainable development, with the following key objectives: (Nations, Food security and nutrition and sustainable agriculture, 2012)

2.3.1. Promoting Sustainable Agriculture: aims to enhance the national capacities of developing countries to improve policies and programs that

support sustainable agriculture. This includes boosting productivity while preserving resources for future generations.

2.3.2. Eradicating Hunger: Ending global hunger remains one of the greatest challenges of our time and a fundamental goal of food security. Currently, around 828 million people worldwide lack sufficient food. Inadequate diets, deficient in essential vitamins, minerals, and nutrients, adversely affect the health and livelihoods of millions, jeopardizing the future of entire communities and nations.

2.3.3. Achieving Economic Development: serves as a key driver of economic growth and poverty reduction, especially in developing countries where agriculture is a primary source of livelihoods. Stable and secure food supplies enhance agricultural productivity, generate income for farmers, and improve food availability and accessibility for consumers. These efforts contribute to poverty alleviation and foster more resilient and sustainable food systems.

3- Algeria's strategy for achieving food security:

Algeria is actively engaged in international commitments to ensure food security at the national level. To this end, the country has implemented legislative measures and established institutional frameworks, notably through the Ministry of Agriculture. Recognizing the agricultural sector as fundamental to food security, Algeria has pursued a series of reforms, beginning with the self-management policy, followed by the agricultural revolution, structural adjustments, and ultimately the development of national strategies for agricultural advancement and food security. These initiatives constitute a comprehensive framework aimed at enhancing agricultural productivity and achieving self-sufficiency. This section examines Algeria's approach to realizing this objective.

3.1. Algeria's National Agricultural Strategy (2005–2015)

Algeria's National Agricultural Strategy (2005–2015) was formulated in January 2006 following a comprehensive review of the agricultural sector conducted in 2005. This strategy introduced a series of programs led by the Ministry of Agriculture and Rural Development to rejuvenate the agricultural economy on a national scale, with the **Rural Renewal Policy** serving as a cornerstone. The policy aimed to revitalize rural areas by

enhancing employment opportunities, fostering economic activities, and ensuring equitable living standards while stabilizing rural populations through improved living and working conditions and access to resources. It also sought to strengthen the viability of rural enterprises, position agriculture as a pivotal component of the rural economy, protect natural resources, and restore cultural heritage. Furthermore, the strategy aimed to promote **social cohesion** and balanced regional development, aligning with Algeria's commitment to the United Nations Millennium Development Goals (MDGs). To safeguard food quality and safety, Algeria introduced a regulatory framework initially focused on potatoes as a pilot crop, with plans for gradual diversification. Additionally, the Ministry encouraged farmers, particularly in remote areas, to adopt **solar energy** as a renewable and sustainable source for irrigation. By integrating modern practices, traditional resources, and renewable energy, Algeria has adopted a holistic approach to rural and agricultural development, emphasizing sustainability, environmental conservation, and the establishment of resilient food systems to achieve long-term agro-economic stability and water security. (Nadia)

Table 2: The Evolution of Economic Indicators for Potato Production in Algeria (2005–2021)

Year	Area (ha)	Productivity (quintals/ha)	Production (tons)	Consumption (tons)
2005–2009	94,968.2	22.28	2,130,927	1,932,200
2010	121,996	27.05	3,300,312	2,384,000
2011	131,903	29.28	3,862,194	2,433,000
2012	138,666	30.42	4,219,476	2,489,000
2013	143,000	30.72	4,886,538	2,544,000
2014	149,544	31.20	4,673,515.5	2,604,000
2015	153,313	129.6	4,539,577	2,668,000
2016	156,308	30.45	4,759,676.6	2,727,000
2017	148,822	30.95	4,604,402.4	2,781,000
2018	143,301	32.48	4,653,322.2	2,833,000
2019	157,864	31.80	5,020,249.4	2,881,000
2020	149,465	32.03	4,659,482	2,925,000
2021	136,855	32.36	4,360,880	2,989,000

Source: Database of the Food and Agriculture Organization and the Arab Organization for Agricultural Development, 2005–2021.

Between 2005 and 2021, Algeria experienced significant growth in potato production, reflecting improvements in agricultural practices and productivity.

- The area dedicated to potato farming increased from 94,968 ha (2005–2009) to a peak of 157,864 ha in 2019, before slightly declining to 136,855 ha in 2021.
- Productivity improved consistently, rising from 22.28 quintals/ha in 2005–2009 to around 32.36 quintals/ha in 2021. This increase indicates the adoption of better farming techniques, fertilizers, and irrigation systems.
- Potato production showed substantial growth, increasing from 2.13 million tons in 2005–2009 to a peak of 5.02 million tons in 2019. However, a slight decline occurred in 2020 and 2021, with production dropping to 4.36 million tons in 2021.
- Consumption steadily increased alongside production, rising from 1.93 million tons in 2005–2009 to 2.99 million tons in 2021, reflecting growing domestic demand.

The period from 2005 to 2021 highlights Algeria's success in increasing potato productivity and production. While the expansion of cultivated areas contributed to growth, the focus on improving yields played a crucial role. However, the recent slight decline in production suggests the need for further investments in sustainable practices and infrastructure to maintain upward trends.

3.2. Modern Agriculture and Fisheries for Optimal Food Security

The food security strategy in Algeria is a critical initiative addressing the pressing need to prioritize food security at the highest governmental levels. It underscores the importance of integrating national and international collaborative efforts as a fundamental component of national, human, and regional security. The strategy, along with its actionable implementation plan, serves as a comprehensive framework to achieve food security, thereby fostering sustainable economic growth.

Although Algeria has never faced a food crisis, it is important to note that achieving food security in the country has been partly linked to global markets that fill the gap in agricultural sector capabilities. Hence, the importance and necessity of achieving food sovereignty in Algeria becomes

clear. Agricultural experts emphasize that sovereignty is no longer limited to self-sufficiency but extends to complete liberation from dependency, ensuring food dignity. This necessitates the development of sustainable national strategies to enhance the country's food security and prevent fluctuations in agricultural product prices in global markets. (Shaligham, 2023)

3.2.1. Regarding agriculture:

the government intends to implement a sustainable agricultural policy that will enhance the country's food security, reduce the trade imbalance in agricultural products, and effectively contribute to diversifying the national economy.

Efforts will also be directed towards agricultural development, rural area development, and desert and mountain agriculture, focusing on implementing structural projects aimed at ensuring harmony and sustainable use of natural resources in rural areas. This will be achieved through encouraging private sector initiatives that will create wealth and generate employment.

The sustainable conservation and improvement of natural spaces, particularly forested and allied areas, will facilitate the development of goods and services that contribute to the well-being of local communities and enhance the national economy. (R.A.D.P, Government action plan for the implementation of the program of the President of the Republic, 02/16/2020, p. 27)

The government aims, by 2030, to achieve the following goals:

- Address basic food requirements by enhancing agricultural output and productivity.
- Establish a modern agricultural and rural framework by encouraging private investment and fostering a new generation of producers.
- Enhance the competitiveness of agricultural, food, and forestry products while integrating them into global value chains.

- Promote sustainable and equitable development in rural areas, particularly in mountainous and desert regions.
- Advance agricultural modernization through the adoption of knowledge-based solutions and digital technologies.

3.2.2. Regarding mountain agriculture:

a specific system will be developed for agricultural and rural development in mountain areas, focusing on various activities. These include:

- Intensifying existing crops and expanding the planting of fruit trees,
- Establishing small-scale livestock breeding units,
- Enhancing traditional products and rural crafts,
- Encouraging small enterprises and youth entrepreneurs involved in the construction of basic infrastructure and development projects in mountainous areas.

Measures will also be taken to rehabilitate forests and ally areas, as well as combat desertification through the restoration of the Green Dam and intensifying beneficial reforestation efforts, particularly family-based reforestation. This will be part of the national reforestation program in mountainous regions and the Green Dam.

3.2.3. Regarding desert agriculture:

the government's approach emphasizes the development of desert and mountainous regions, with a strong focus on implementing an ambitious development program centered around the following initiatives:

- Developing desert pathways to support camel and goat breeding activities through the rehabilitation and/or improvement of water sources and livestock health coverage.
- Enhancing camel products by establishing small-scale service units, slaughterhouses, small dairies, and traditional craft units.
- Rehabilitating traditional oasis systems and developing structured projects.
- Protecting and renewing palm groves, rehabilitating the "fakkara" (underground water channels), and acquiring water-efficient irrigation systems, as well as renewing drainage systems.

- Rehabilitating agricultural areas and modernizing oasis systems by promoting the use of renewable energy technologies.

3.2.4. Regarding fisheries and marine resources:

maritime fishing and aquaculture activities hold a strategic importance due to their ability to contribute to improving the country's food security by enhancing and diversifying the supply of high-quality fishery products. These activities also play a role in the emergence of a productive and diversified national economy and the integrated economic valuation of the marine and coastal environment.

The key objectives in the field of sustainable development of maritime fishing and aquaculture activities include increasing the national supply of fishery products by promoting and developing large-scale aquaculture and advancing deep-sea fishing. At the same time, special attention will be continuously given to the sustainable and responsible management of current maritime fishing activities, as well as improving the social and economic conditions of marine fishing and aquaculture professionals. (R.A.D.P, Government action plan for the implementation of the program of the President of the Republic, September 2021, p. 36)

Efforts will also be made to support productive investment in the fisheries and aquaculture sectors through:

- Reviving the development of national industries in these sectors.
- Encouraging the establishment of small and medium-sized enterprises in the field of fish product processing and valorization.
- Promoting a national industry for the construction of shipyards and fleet maintenance.

In the end, we believe that achieving food security is one of the most important challenges that Algeria must overcome. However, the current situation, in all its aspects, urgently requires the implementation of new strategies and complete liberation from global markets. Achieving food security necessitates moving beyond short-term, circumstantial solutions, such as those characterizing current policies, and adopting a clear and long-term strategy to develop the national economy in general and the agricultural sector in particular. Food security is closely linked to national

sovereignty, as a country that does not eat what it grows leaves its sovereignty vulnerable.

3.3. Agricultural Sector Achievements During the Period 2020-2024

Between 2020 and 2024, the Algerian government prioritized the agricultural sector to enhance food security and promote economic diversification. Efforts focused on fostering rural development and optimizing agricultural productivity in forested areas, desert regions, high plateaus, and mountainous zones, given their significant potential for growth. A key aspect of this strategy involved expanding industrial crops to reduce import dependence and achieve self-sufficiency in essential commodities such as oils, sugar, and animal feed. Financial support and risk management mechanisms were strengthened through the introduction of rural cooperative credit, agricultural disaster insurance, and social protection measures to safeguard farmers' income and ensure sector resilience.

To advance self-sufficiency in staple foods, targeted initiatives were implemented, notably revitalizing the dry legume sector by expanding cultivation areas to 150,000 hectares and dedicating 34 model farms, covering 37,700 hectares, exclusively to legume production. Agricultural cooperatives were also restructured to enhance governance, simplify administrative procedures, and encourage fair competition by allowing multiple cooperatives of the same type within a single region. Regulatory adjustments were introduced to improve oversight and operational efficiency. Water resource management was another critical component, with investments directed toward irrigation infrastructure, particularly in the high plateaus and southern regions, to mitigate climate risks and ensure sustainable agricultural development. Measures were taken to modernize the sector by integrating renewable energy, with efforts to connect farms to the electricity grid, facilitating mechanization and efficiency. An extensive survey identified 4,062 farms within proximity to the national electricity network, with an estimated investment of 325 billion dinars allocated to their integration. These comprehensive initiatives aim to establish a resilient agricultural system capable of sustaining food security and achieving long-term self-sufficiency.

4. Conclusion:

Food security is one of the most pressing challenges that countries must address to ensure the well-being of their populations. Achieving food security requires not only ensuring the availability of sufficient and healthy food but also guaranteeing sustainable and equitable access to nutritious food for all. For Algeria, despite its considerable agricultural potential, the sector faces significant obstacles that hinder its ability to meet the food security needs of its citizens. Therefore, it is crucial for the government and decision-makers to adopt comprehensive financial and economic policies aimed at revitalizing the agricultural sector. These efforts must focus on developing long-term strategies that reduce food dependency, enhance national self-sufficiency, and support the growth of non-oil exports. Only through a well-coordinated approach can Algeria achieve sustainable food security and contribute to the broader goal of national economic development.

5. Recommendations:

- **Focus on Sustainable Agriculture:** Algeria should prioritize sustainable agricultural practices that preserve natural resources while enhancing productivity.
- **Enhance Investment in Research and Development:** Algeria needs to strengthen its investment in agricultural research and development to improve crop productivity and resilience to climate change. Efforts should also be directed toward upgrading infrastructure, adopting advanced technologies, and promoting education and awareness about healthy nutrition.
- **Develop Robust Local Markets:** Establishing strong local markets is essential to improving access for domestic producers, ensuring market stability, and protecting consumers from speculative practices.

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