Sustainable rural development and its role in achieving and enhancing food security in Algeria
A reading of the experience of the Saudi Agricultural Development Fund 2018-2025

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Abstract :

The aim of this research is to highlight the relationship between sustainable agricultural rural development and achieving food security in Algeria. In order to achieve the objectives of this research, we relied on the descriptive analytical approach by describing the components of sustainable agricultural development and the factors affecting the achievement of food security, then studying and analyzing data and statistics issued by National, regional and international bodies.

Regarding Saudi Vision 2030, the Sustainable Agricultural Rural Development Program 2018-2025, and the National Food Security Strategy 2017-2030 constitute the most prominent images of Saudi Arabia's interest and efforts in achieving rural development and food security.

This research concluded that sustainable agricultural rural development has an essential role in achieving food security through its pursuit of economic and social development and environmental sustainability, in addition to providing financial resources and legal legislation stimulating this.

Keywords : rural development, sustainable agricultural development ; food security ; Sustainable agricultural rural development strategy, agricultural and rural renewal.

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I- Introduction:

The issues of agricultural development and food security are at the forefront of the concerns of Arab leaders, and the priorities of joint Arab action in light of contemporary economic and environmental changes at the regional and international levels.Therefore, Arab efforts are directed to address all the challenges facing the process of agricultural development and food security in the Arab world.

The world population has reached 8 billion and is expected to continue to rise at a rate of about 1 percent per decade until at least 2050. An increasing number of people means having more mouths to feed. However, the way we eat has changed dramatically in recent years, with increasing demand for resource-intensive and environmentally impactful food. Modern eating habits have put a strain on the planet's resources, harming global food security and contributing to accelerating global warming.

Acute hunger increased in 2025 for the sixth year in a row. Some 295 million people now face high levels of acute food insecurity, and most people suffer from the most severe forms of acute food insecurity (IFS/Chapter V) and famine in countries affected by conflict. Conflicts, insecurity, extreme weather conditions, and economic shocks continue to lead to acute food insecurity.According to the 2025 Global Report on Food Crises, the Agricultural Development Fund launched a new financing product to finance "rural farms." This aims to develop farms, diversify their sources of income, ensure their sustainability, and benefit from comparative advantage opportunities in rural areas, in addition to preserving the plant and animal environment, and raising the rate of environmental and rural tourism.

By providing financing, the Agricultural Fund seeks to support agricultural and rural tourism, work to help farmers in the process of improving the services provided to visitors, and enhance the visitor experience in general.

The Agricultural Fund specified the method of financing by financing existing and productive agricultural holdings in the agricultural sector with investment and operational costs, noting the necessity of having a title deed or a developed agricultural register, obtaining a license from the Ministry of Environment, Water and Agriculture for this activity, and submitting a simplified technical study that clarifies the areas required to be financed.The farm is productive and its area is suitable for agriculture and agritourism.

Through this article, we will talk about this topic through the following problem :

The extent to which sustainable rural development can be said to contribute to the dimensions of food security and sustainability

In Algeria ? With a reading of the experience of the Saudi Agricultural Development Fund 2018-2025 ?

1-1The importance of the study :

The importance of the topic lies in the fact that it simulates the reality in which we live under conditions of acute food insecurity, and attempts to provide a theoretical vision and analyze information about food security, through research and revealing the role of agricultural rural development issues and their importance in overcoming the food problem that many countries suffer from.The importance of the paper in knowing food security and its dimensions, as well as knowing the most important challenges that guide Arab food

security, is also clear And ways to achieve it in light of crises and disasters. With a reading of the experience of the Saudi Agricultural Development Fund 2018-2025 ?

1-2 Objectives of the study : This study aims to:

-The future of modern agricultural rural development in achieving food security.

-Identifying the main obstacles limiting the achievement of global food security.

-Identify the most important indicators used to measure global food security.

-Analysing the effects of financing programmes on the performance of the agricultural sector and food security in Algeria.

-Trying to analyze the Arab food security report and clarify the policies adopted to reduce or remove these obstacles in order to achieve international food security.

-In this context, it shows the role that agricultural rural development can play, as a mechanism to protect the agricultural sector from the effects of severe climate change, which has become a major threat to agricultural development.

1-3 Research methodology :

In order to cover all aspects of the topic, and to answer the problem at hand and the stages it contains, and in line with the requirements of the scientific method in terms of selecting and determining the appropriate method for the study, the descriptive method was adopted through analysis and the use of studies and statistics that were familiar with the topic in addition to a group of sources and references related to the research.

1-4 previous studies :

*Benkheznadji Amina and Mazouzi Driss 2024 monographtitled,

TheImpact Of Agricultural Public Spending On Food Security In Algeria : An Economic Study For The Period 2001-2021

The study aims to analyze the relationship between government spending on agriculture and per capita food supply as an indicator of food security in Algeria.Using a multiple regression model, the study found that all variables, except the consumer price, had a positive effect on the rate of food energy supply, and that increasing these variables It led to a decrease in food insecurity. The flexibility of agricultural public expenditure was found to be the most important factor, followed by gross national income (GNI), however, despite the positive relationship, the impact of agricultural public expenditure remained weak, indicating the need to reorient agricultural support policies.

*The study of researchers Al-Mahi Thouria and Ozal Abdelkader (2020), entitled "The impact of the agricultural financing policy on the performance of the agricultural sector in Algeria in the period (2000-2018).The aim of this study is to evaluate the impact of the agricultural financial policy implemented by the state within the framework of agricultural policies since In 2000, on the performance of the agricultural sector, through performance indicators that show the extent to which agricultural financing contributes to economic development, foreign exchanges, and achieving food security.The study concluded that the agricultural financial policy adopted by the state was unable to achieve an improvement in the performance of the agricultural sector and did not contribute to developing its contribution to economic development or achieving food security.

*Researcher Ben Shahida Sarah’s study (2023, entitled "The Role of Agricultural Investment in Achieving Food Security in Algeria: A Standard Study Using the Error Correction Ray Model (VECM) during the Period (2021-1990).The study focused on

testing the interconnected relationship between agricultural investment and food security in Algeria from 1999 to 2021, using the co-integration methodology and the error correction ray model.(VECM The agricultural production index in this study is considered a key indicator of food security. It was concluded that there is a positive relationship between human capital and food security. The results also show an inverse relationship between agricultural investment and food security over the short and long time period.

*Study by researchers Tayr Muhammad and Bouzid Al-Sayeh (2023, entitled "The Impact of Development Support Programs on the Agricultural Sector and Food Security in Algeria." The study focused on analyzing the main agricultural programs for support and financing, and evaluating their impact on the performance of the agricultural sector and achieving food security in Algeria. The study touched on several indicators that clarify the relationship between these two variables. The study concluded that financing programs have a positive impact on some agricultural products, other than the wheat sector, on which achieving food security still depends.

Accordingly, the study is divided as follows :

2-The theoretical framework for rural agricultural development and food security.

3-The reality of the agricultural sector at the level of the Arab world.

4- Sustainable agricultural rural development and achieving food security in Algeria.

5-A reading of the experience of the Saudi Agricultural Development Fund 2018-2025

2-The theoretical framework for rural agricultural development and food security.

2-1 The concept of rural development

Rural development is the process that aims to develop life in the countryside, improve its quality, and provide economic support to individuals living in rural areas. Rural development is also defined as benefiting from agricultural lands, through the development of natural resources that help provide the basic needs of rural residents. Rural development is also building a rural society based on a set of foundations, which aim to grow the countryside in many areas such as education, health care, infrastructure, and others. **(Boualem, 2005)**

2-1-1 Rural development goals.

Benefiting from all arable land, which contributes to providing many natural resources that provide support for rural development. Searching for the best means to help improve life in the countryside. Providing the basic needs of residents in rural areas and raising their standard of living. Contributing to providing economic support to the countryside, which helps reduce the spread of poverty among the population. Working to provide public educational institutions in rural areas, which contribute to eliminating illiteracy. **(abegunde, 2019)**

2-1-2 Foundations of rural development.

The success of rural development in achieving its goals depends on the presence of a set of main foundations, which are :

* Development in agricultural production : which contributes to raising the share of the countryside in the gross domestic product, and this reflects positively on the population, which leads to an increase in public income in the countryside. **(akamani, 2021**)
*Full attention to education and health : especially for children.This contributes to eliminating malnutrition and reducing the spread of diseases, which leads to achieving social balance
* Monitoring the distribution of income : in a fair manner among all individuals working in the rural community
* Enhancing the participation of rural residents in political decision-making : by having political representation in Parliament
* Applying a group of studies : which rely on field visits and statistical lists that provide accurate information about population numbers, the employment and unemployment rate, the education rate, and other rates that reflect the nature of life in the countryside.
*Means of activating rural development : directing government policies to pay attention to rural development : and providing full support for its success in achieving its goals
*Appointing an administrative body of rural residents : which works to manage local and public affairs in the rural community.Examples of these administrative bodies include : the municipal council and the Mukhtar district
*Allocating a financial grant to the countryside : which contributes to supporting its economy and development in all public fields.
Working to establish public sector institutions in the countryside : which are concerned with following up on specific areas in rural society, such as : agricultural institutions that provide support to farmers.
* Supporting the role of private and international bodies : by establishing branches in the countryside, and this contributes to providing a range of services to the rural population, such as : sports stadiums, public libraries, health centers, and others. **(Quesnay, 2002)**

2-2 Sustainable agricultural and rural development.

2-2-1 The concept of sustainable agricultural development.

Sustainable agricultural and rural development enables sustainable production and environmental protection, brings tangible benefits to forests, wildlife, water and soil, and reduces negative impacts on agriculture while maintaining or increasing production. The focus on sustainability has also had a strong impact on the emergence of intergovernmental mechanisms related to biosafety and biodiversity. The Food and Agriculture Organization defines sustainable rural development as a process that meets the following criteria: - Ensuring that the basic nutritional requirements of current and future generations are met in terms of quality and quantity, while providing a number of other agricultural products. - Provides permanent employment, adequate income, and decent working and living conditions for all those working in agricultural production. - Maintains the productive capacity of the natural resource base as a whole and, where possible, enhances the regenerative capacity of renewable natural resources Without disturbing the functioning of basic ecological cycles and natural balances, destroying the social and cultural features of rural communities, or causing pollution of the environment; reduces the vulnerability of the

agricultural sector to negative natural and socio-economic factors and other risks, and strengthens the self-reliance capacity of local communities.

2-2-2 Agricultural development goals.

The agricultural sector faces many challenges and obstacles, such as the problem of desertification, climate change, water scarcity, transient diseases that may affect plants or land, and other problems that affect the productivity of the agricultural sector.Therefore, the governments of many countries have developed strategies and programs to confront these challenges and to fully benefit from the agricultural potential.Available, and the objectives of these strategies are as follows:

• Preserving, developing, improving and maintaining all available agricultural resources and capabilities, making optimal use of those resources, and achieving the highest possible returns from those resources such as land, water, capital and labor.

• Achieving the highest degree of food security, especially for food crops, and providing the necessary raw materials for national industries.

• Providing many job opportunities for youth and females in the agricultural sector and related activities.

• Achieving sustained agricultural growth rates that exceed population growth rates.

• Increasing the proportion of processed and fresh agricultural exports, and supporting the competitive strength of various agricultural products in all local and international markets.

• Improving the income and standard of living of rural and agricultural populations, and reducing the rural poverty rate.

• Adapting to climate change and reducing its effects. **(Hufkens, 2020)**

2-2-3 Various concepts associated with urban food security.

2-3-1What do we mean by food security ?

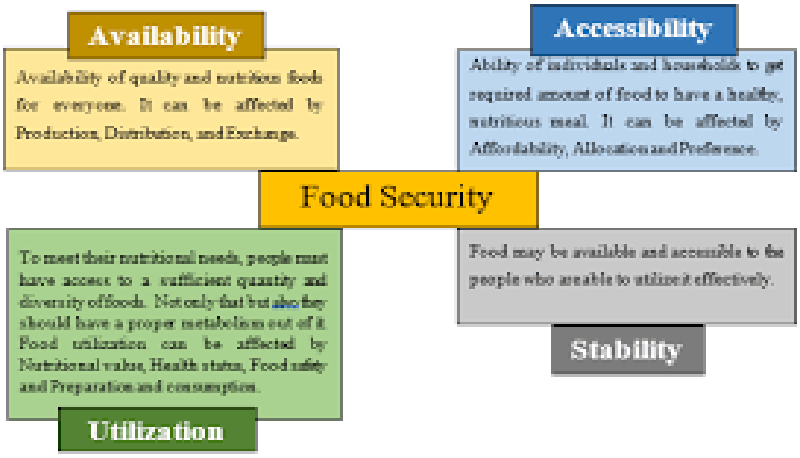
The term absolute food security expresses the production of food within a single country that equals or exceeds local demand.This is synonymous with complete self-sufficiency and is also known as self-food security.

This broad, absolute definition of food security is considered unrealistic, and it deprives the country or country concerned of the possibility of benefiting from international trade based on specialization and division of labor and exploiting comparative advantages...

As for the FAO concept, it defines food security as “providing food to all members of society in the quantity and quality necessary to meet their needs on an ongoing basis for a healthy and active life ”, and at this point we conclude the necessity of providing the qualitative dimension in food alongside the quantitative one, with reference to continuity, which means Sustainability This means that the issue is not reactions to the Becharamin crisis 2022)K This definition identifies four pillars of food security, which are: physical, economic and social access to food, food availability, and the quality of products in terms of health and nutrition. **(Diko, 2018)**

Regular access to food, its availability throughout the year and its quality.

Figure N°01 : Components of food security.



Source : Food and Agriculture Organization of the United Nations.

Within each level food security is affected by a wide range of factors including general issues such as : population size, economy and environment, and more specific issues such as employment and access to water services, sanitation, availability and quality of health services, the impact of local and global events, shocks and risks and the quality of performance.Logistics/infrastructure and others. (Food and Agriculture Organization of the United Nations, 2022)

Figure N°02 : Levels of food security.



Source : (ESCWA, 2020 pages80)

2-3-2 Concepts related to food security :

A. The concept of food self-sufficiency :

The Food self-sufficiency means the ability to achieve complete dependence on oneself, resources, and one's own capabilities in producing all of the community's food needs locally.

B. Food safety : Starting in the mid-eighties, the world knew relative food security mainly due to the increasing use of chemicals in modern agriculture. However, increasing agricultural productivity in this way brought many concerns to consumers, and talk began about a new way to increase productivity that is safer for human health, such as alternative agriculture or organic agriculture. So what is food safety ?

The World Health Organization's concept of food safety means all the necessary conditions and standards necessary - during the processes of production, manufacture, storage,

distribution and preparation of food - to ensure that food is safe, reliable, healthy and suitable for human consumption. **(2020،عبود)**

Urban food security is defined as : the condition that guarantees urban residents physical, economic and social access to safe, sufficient and diverse calories and micronutrients for a healthy lifestyle. **(TCCGA, 2013)**

C. organic agriculture :

Organic farming is a production system that avoids or excludes artificially synthesized fertilizers, pesticides, growth regulators, and animal feed additives

D. Agricultural intensification : Agricultural intensification is defined as the intensification of returns from the use of resources. It is known that the determinants of agricultural expansion are land and water, so agricultural intensification is done by maximizing production per unit area of land or unit cubic meter of water. **(Németh, 2021)**

3- The reality of the agricultural sector at the level of the Arab world

Looking at the current reality of agriculture in the Arab world, we find that the total area of the Arab region amounts to about 114 billion hectares (about 14 million square kilometers), which makes the area of the Arab world equivalent to about one and a half times the area of the United States or China, while the area of agricultural land in it is estimated at about 200 million hectares, equivalent to about 14% of the total area.

However, only 70 million hectares of this arable area, or less than half of it, are actually cultivated, and from here the extent of the shortcomings in this sector becomes clear, which resulted from many obstacles that affected its productivity and its ability to achieve self-sufficiency in food for the population, which requires developing a strategy for Arab countries to overcome these obstacles.The obstacles vary between environmental and economic obstacles.

By reviewing the most important of these obstacles and ways to overcome them, we find that the first obstacle is the scarcity of water, as the Arab region is considered one of the driest and most water-scarce regions in the world.About 85% of its area is located within dry and semi-arid areas, which has led to 20% of its lands being exposed to the phenomenon of desertification.

This requires developing traditional irrigation techniques and applying modern irrigation systems, in addition to paying attention to water desalination projects and reusing agricultural and sanitary drainage water to irrigate agricultural lands, while increasing cooperation between Arab countries in the areas of water resources management and maximizing the benefit from every available drop of water. In this context, we must benefit from the experiences of some countries in the field of agriculture in dry areas, such as West America, northwest China, and northeastern Brazil. **(dubois, 2019)**

Climate change is considered the second most prominent obstacle facing the Arab region as a result of its exposure to waves of drought and high temperatures, which negatively affect the productivity of agricultural crops.

As shown by the reports of many international bodies concerned with climate change, the most important of which is the Intergovernmental Authority, which warned that the Arab

region is threatened with a decline in agricultural crop productivity by up to 20% by 2050 as a result of the available changes.

However, this problem can be overcome by growing crops that are resistant to drought and salinity, in addition to enhancing scientific research in the fields of combating desertification and using the main programs and results to analyze the effects of climate change on agriculture in the region and develop varieties of agricultural crops that are characterized by resistance to harsh climatic conditions, as well as genetically modified crops to resist drought.Salinity and heat using genetic engineering, which is one of the most important modern sciences that works to adapt crops to the surrounding environment.

The third challenge facing agricultural development in the Arab world is the use by most Arab countries of traditional agricultural systems with low productivity compared to many countries that currently use modern technology that works to increase productivity and improve quality.

The most important of these technologies are precision agriculture, smart agriculture, and mechanization of agricultural operations using the latest agricultural machines.All of these systems work to increase productivity and reduce crop losses.

Investments in scientific research centers must also be increased and farmers' awareness of the importance of using modern methods in agriculture must be improved through advanced training programs and the exchange of experiences between Arab countries, leading to government initiatives aimed at studying regional challenges and applying modern systems and technologies while providing soft loans to farmers to help them implement them.These systems and technologies.

By reviewing the realities and challenges previously presented, and in order to achieve self-sufficiency in food and increase agricultural exports of some crops that characterize the Arab region, more investments must be attracted and a supportive environment provided for local and international investors with the aim of expanding small and medium agricultural projects and investing in research and development.And new and innovative technologies that achieve increased productivity.

There are many successful examples that have been completed, such as the one and a half million acres project in Egypt, which helped increase the agricultural area and provide many job opportunities, and the project to expand hydroponics in the Emirates, which led to improving the production of vegetable crops while reducing irrigation water consumption, in addition to the Green Morocco Strategy Project, which has achieved great success in developing the agricultural sector in the Kingdom by focusing on innovation and sustainability.

These projects provide positive indicators of the possibility of achieving the aspirations of the Arab world to achieve self-sufficiency, expand agricultural activities, and overcome the challenges and obstacles facing the agricultural sector. But this requires intra-Arab cooperation, the exchange of experiences and investments, and the development of appropriate strategies to make the most of Arab agricultural wealth.

Table 01 : Production, consumption and gap for total food groups until the year 2050

The years	Production	Consumption	The gap
The average for the period 1996-1998	144.91	194.25	49.34
The average for the period 2006-2008	184.11	260.86	76.75
The average for the period 2016-2018	210.38	311.56	101.18
Expected 2030	272.02	402.85	130.83
Expected 2050	404.35	589.82	194.47

Source : Arab Organization for Agricultural Development 2022, p33.

4- Sustainable agricultural rural development and achieving food security in Algeria.

By studying and analyzing the effects of expected climate changes on the productivity of the most important agricultural crops in Algeria, it has been concluded that the phenomenon of climate change will affect the food security of these crops by the year 2050.Accordingly, the climate-smart agriculture approach must be used and adopted as a global approach to confront the effects and repercussions of climate change.climate in the future.

It is based on the use of adaptation mechanisms that combat climate change, through specific activities such as the use of species Crops that are resistant to drought or salinity, use water resources more efficiently, and improve pest management can Changes in agricultural patterns include reducing the use of fertilizers, as agriculture can contribute positively to Reducing carbon dioxide emissions by absorbing it.Agriculture can also play a role in reducing combustion Fossil fuels, and it is possible to replace about 20% of fossil fuel consumption in the short term using fuel Biomass, fast-growing grasses, oilseeds and agricultural waste offer great potential as alternatives for energy generation. (أحمد سلمان، 2019)

In light of the continuing controversy over the rise in global food prices, the economic strategy in various countries of the world is focused on supporting local agriculture, especially in desert areas, which prompted Algeria to plan to start a security, by giving Great importance to specialized scientific research in the field of agriculture, and motivating young people to engage in programs of an agricultural nature Below we will present Algeria's plan to expand the smart agriculture system to achieve food security: (سعد، 2022)

• The latest report of the World Food Security Program issued by the United Nations ranked Algeria first in Africa in terms of food security, where it received a rating of 63.9%, making it among the countries capable of supporting the efforts of the United Nations program that aspires to achieve “zero hunger” by the year 2030

• The Algerian government pledged to double these numbers by supporting smart agriculture, to expand irrigated areas and improve the rational exploitation of agricultural lands, by digitizing sector programs.

• The future plan aims to develop the agricultural sector in rural areas, to implement the rural agricultural renewal policy.

• Algeria views agroecology as an essential support for organic agriculture and local products

• Encouraging young people to establish mini-projects to provide the basic foodstuffs that citizens need daily.

• Algerian economic figures indicate that agriculture's contribution to the gross domestic product does not exceed 13%, or about 25 billion dollars.

4-1 Algerian food security indicators.

4-1-1 Global Food Security Index :

The Global Food Security Index is considered one of the most important indicators of the food security situation issued by the Economist impact magazine for 113 ountries.Algeria's situation is as follows

Table N° 02: Algeria's food security ranking globally 2020-2022.

	2020	2021	2022
Index value	61.8	63.9	58.9
Ranking	58	54	68

Source : Economist impact 2020, 2021, 2022.

It is clear from the previous table that there was an improvement in Algeria's ranking during the years 2020 and 2021, which moved from rank 58 in 2020 to rank 54 in 2021, with a significant improvement compared to the year 2019, where Algeria was ranked 70th globally (out of 113 countries), but it witnessed a decline of 05 degrees in 2022, and thus Algeria's ranking fell to rank 68 in 2022

Accordingly, it can be said that there is a fluctuation in the value of the food security index, as well as a decline in Algeria's ranking following the decline in the index for the year 2022, which makes us say that the efforts made in this regard, despite their good results, remain insufficient, especially when compared to other countries (what the ranking highlights).

As for the sub-indicators of this indicator for the year 2022, which are :

Affordability: The index was estimated at 66.8 Availability: 57.3 F - Quality and Safety: 54.7 As for Sustainability and Adaptation: 54.2 According to the same report, we find that Algeria achieves an acceptable level with regard to the provision of food and the ability of individuals to access it, while this index decreases with regard to the quality and safety of food.Food, as well as its sustainability on the other hand, poses major challenges to national food security that must be confronted with strategic policies and procedures. **(Impact, 2023)**

4-1-2 Food gap index :

The food gap generally indicates the difference between the total food needs of the state and what the state produces and satisfies locally of these needs.Therefore, the wider the difference between the two workers, the wider the gap or food gap becomes, and the more the state tends towards importing its food needs from abroad, and the weaker and fragile its food security is.Therefore, it is considered one of the most important indicators of food security.

With regard to Algeria, the latter was determined during the previous four years as follows :

Table N°03 : The food gap for Algeria during the period 2020-2023

The year	Food Imports	Food exports	Food gap
2020	7723	437	7286
2021	8877	575	8301
2022	10369	269	10100
2023	992	428	564

Source : Prepared by researchers based on reports from the Bank of Algeria, Annual Development Report
Economic and Monetary Affairs of Algeria : 2021-2024

From the previous table, it is clear that Algeria records a significant food gap, as we note that the country's imports of food commodities greatly exceed the value of its exports, and therefore, from what can be concluded from this table, agricultural production, especially as it is the most important food producing sector, is still weak because it does not meet all the needs.National food, Which led to an increase in the value of food imports on the one hand and a decrease in their exports on the other hand, which exposes national food security to fragility and danger, and that there is a large sale abroad in the field of food. **. (Mohammed, 2002)**

Food exports have witnessed a continuous increase, with the exception of the year 2022, when they recorded a significant decline estimated at more than $3 billion compared to the year 2021, thanks to the efforts and measures taken to encourage local agricultural production. These exports consist largely of sugar, dates, and figs.

As for imports of food commodities, in turn, they witnessed a continuous increase, moving from $07.72 billion in 2020 to $8.88 billion in 2021, with an increase estimated at 1.15 billion, representing 23.73% of total imports.This increase is mainly due to wheat imports ($1.15 billion and sugarcane more than 250 million).dollars) (Bank of Algeria, 2021 pages, 81) Food imports continued to rise in 2022 by more than $10.369 billion (triangle %26.7 of total imports) and this increase is always due to Cereal imports ($1.22 billion), but during the year 2022, global prices for many basic food products witnessed an increase over the year 2021 However, these food imports (a triangle of 23.2% of total imports of goods in 2022) witnessed a decline in 2023, recording a value of $9.92 billion, as this decline is due to a decline in grain imports worth $1.18 billion. (Algeria, 2024, page 85) This is after Algeria recorded record levels of grain production in 2023, which aspires to achieve self-sufficiency in wheat within the year 2024.

In order to reduce the import bill, Algeria seeks, through the 2020-2024 plan, to invest in areas from which it imports large quantities, including the cultivation of oil rape by planting 3,000 hectares to produce table oil locally, as well as the cultivation of sugar beets and both types of wheat.

Therefore, this matter urgently calls for adopting strategies to advance this sector and raise its contribution to the development of the national economy, exploiting the many capabilities and capabilities that Algeria possesses in this regard, intensifying efforts in this regard, and at the same time valuing products that have a competitive advantage to raise its exports abroad.

4-2 Local agricultural production and food security challenges in Algeria :

Abundance of major food products : Food security is based primarily on the abundance of basic food commodities and products that the individual mainly consumes, and therefore the abundance of the latter and its availability to individuals at appropriate prices and appropriate quality is considered one of the most important indicators of food security.

The state's interest in the agricultural sector in recent years has led to improved production in some types of food, but despite this, it is considered insufficient to meet the national food needs, which makes it even more necessary to make greater efforts to confront all the problems that the sector is aware of, leading to optimal exploitation of all its capabilities.

The agriculture and fishing sector contributes more than 33,000 billion Algerian dinars to the gross domestic product for the year 2023, recording an increase compared to the year 2022, when it contributed 10.4%, achieving an added value of 4,204.47 billion dinars in 2023, compared to 3,323.06 billion dinars in 2024.

Page 24 The growth of the agricultural sector in Algeria during the past five years was as follows :

The agricultural sector has witnessed a continuous increase in its revenues from 2019 until 2023, but the major boom occurred during the year 2023, with it recording more than 4,000 billion dinars in revenue value, recording a real growth rate for the sector exceeding 5% per year2023 This growth is due to the great interest this sector has received in the past few years within the framework of the economic diversification policy, supporting farmers, and taking many decisions and measures with the aim of developing agricultural production and raising its revenues, especially in the main divisions of this sector

Such as grains, vegetables, fruits, meat,..

Cereals: Cereal crops witnessed a significant fluctuation in production.The latter recorded a significant decline in 2023, with an estimated production of 9.5 million quintals, after achieving a return of 41.9 million quintals in 2022, a decrease of 77.21%.This decline included various cereal crops, such as the crop of both types of wheat (hard wheat).With 72.74% and soft wheat with 78.61%, as well as barley with 86.78% and oats with (82.43%) Algeria,,2024 pages (21) This is compared to production estimated at 27.6 million quintals in 2021 and 43.9 million quintals in 2021.

Table N°04 : Grain production in Algeria 2020-2023.

year	2020	2021	2022	2023
Production/million quintals	43.9	27.6	41.9	9.5

Source : From among researchers based on reports from the Bank of Algeria.2024, 2023, 2022, 2021

From the previous table, it is clear that Algeria does not achieve high levels of grain production that cover the national need, as the latter constitutes one of the most imported materials with high budgets, as mentioned previously.

This fluctuation is largely related to weather conditions, as happened in 2022, when altitude and production were linked to appropriate weather conditions, in contrast to the drought that affected the year 2021

Vegetables: Vegetables constitute one of the main branches of agricultural production and one of the most important consumer items, as they are one of the main sources of all nutrients (vitamins, proteins, etc.)..

Table N°05 : Vegetable production in Algeria 2023 -2020

Unit : one million quintals.

year	2021	2022	2023
Production	146.3	135.6	132.2

Source : From among researchers based on reports from the Bank of Algeria.2024, 2023, 2022, 2021

The table shows the continuous decline in vegetable production in Algeria from 2021 to 2023.The main reason for this decline is the decline in potato production (38.5 million quintals in 2022 and 43.6 million quintals in 2021) and onions (15.2 million quintals in 2022 and 17.1 million quintals in 2021).(Algeria's annual economic and monetary development report for the year 2023, 2022, page 26)

This sector still suffers from weak local and foreign private investments.Therefore, this sector is witnessing continuous reforms in the field of supporting farmers, encouraging local and foreign agricultural investment, and trying to reform the investment climate in Algeria in general through reforming the investment law.

5- A reading of the experience of the Saudi Agricultural Development Fund 2018-2025.

The Agricultural Development Fund launched a new financing product to finance "rural farms." This aims to develop farms, diversify their sources of income, ensure their sustainability, and benefit from comparative advantage opportunities in rural areas, in addition to preserving the plant environment and animals, and raising the rate of environmental and rural tourism (Benziouche, 2010).

By providing financing, the Agricultural Fund seeks to support agricultural and rural tourism, work to help farmers in the process of improving the services provided to visitors, and enhance the visitor experience in general.

The Agricultural Fund specified the method of financing by financing existing and productive agricultural holdings in the agricultural sector with investment and operational costs, indicating the necessity of having a title deed or a developed agricultural register, obtaining a license from the Ministry of Environment, Water and Agriculture for this activity, and submitting a simplified technical study that clarifies the areas required to be financed.The farm is productive and its area is suitable for agriculture and agritourism.

5-1 The Sustainable Agricultural Rural Development Program "Reef"

is a Saudi government development financing program, inaugurated by the Custodian of the Two Holy Mosques King Salman bin Abdulaziz Al Saud on Jumada Al-Awwal 3, 1440 AH/January 9, 2019 AD.It is organizationally linked to the Ministry of Environment, Water and Agriculture, and aims to achieve development.Balanced economic and social development among various segments of society, through optimal and sustainable exploitation of renewable natural, agricultural and water resources in the Kingdom of Saudi Arabia.

The role of the sustainable agricultural rural development programme.

The Agricultural Development Fund provides financing loans and credit products to small farmers, livestock breeders, beekeepers, honey producers, small fishermen, and agricultural

cooperative societies, in order to exploit available agricultural natural resources, achieve efficient use of them, improve the income of small farmers and breeders, in addition to raising the economic value of the agricultural sector.

The Kingdom's government approved an amount of 8.750 billion riyals for the program during its first phase extending until 2025 AD, in addition to three billion riyals provided by the Agricultural Development Fund.

5-2 Developing a sustainable agricultural rural development program.

The Ministry of Environment, Water and Agriculture, in cooperation with the Food and Trade Organization of the United Nations (FAO), developed a sustainable agricultural rural development program in the Kingdom, with the aim of exploiting and investing in available opportunities and resources, in addition to harnessing and benefiting from natural resources, agricultural potential and population in the regions.

The program has several objectives, including: empowering small producers in the fields of agriculture, livestock raising, fish farming and fishing, in addition to beekeeping and honey production.The program will work to exploit and invest in the opportunities and resources available to diversify the agricultural production base in rural areas, and improve the income level of small farmers.Providing job opportunities and contributing to food security and balanced development.

5-3 Sectors of the sustainable agricultural rural development program.

The program has eight sectors : production, processing and marketing of Arabica coffee, beekeeping and honey production, development of rose cultivation and aromatic plants, production, processing and marketing of fruits, enhancing the capabilities of small fishermen and fish farmers, developing the small livestock breeders sector, and growing rain-fed crops "sorghum, sesame and millet." Enhancing the added value of small farms and their agricultural activities.

The first phase of the sustainable agricultural rural development programme During its first phase until 2025 AD, the Sustainable Agricultural Rural Development Program works to achieve food security in the Kingdom, by providing 43% of the total food energy needs of the residents of the targeted areas, and about 19% of the total needs of the Kingdom, in addition to ensuring easy access to healthy food.Providing stable food supplies.The program will also contribute to increasing women’s participation rates in the Saudi labor market, in accordance with the goals of Saudi Vision 2030.

In order to apply global models in agricultural rural development, the Ministry of Environment, Water and Agriculture cooperates with nine relevant bodies: the Ministry of Municipalities and Housing, the Ministry of Human Resources and Social Development, the Emirates of the Regions, the General Authority for Small and Medium Enterprises, the Council of Cooperative Societies, and the agricultural committees in the chambers of commerce, small agricultural producers, colleges of agriculture in the Kingdom’s universities, all the way to the Food and Agriculture Organization of the United Nations (FAO), as the advisory body that follows up the program.

Table N° 06 : Evolution of the volume of funding provided by the Saudi Agricultural Development Fund for the Rural Development Program 2018-2022

year	Loan volume	Growth rate
2018	65	-
2019	111.3	42%
2020	612.8	95.5%
2021	178	-17.9%
2022	693.5	24.9%
Total	764.2	-

Source : Prepared by researchers based on the annual reports of the Saudi Agricultural Development Fund

The Fund continues its support to achieve self-sufficiency and food security in the Kingdom, as the self-sufficiency rate in red meat reached 61% at the end of 2024, and the Fund aims to raise this percentage through new projects that support the sector.

The agricultural sector also contributed to the Kingdom's gross domestic product by more than 110 billion riyals in 2024, which reflects the continued growth in the agricultural sector thanks to the Fund's support and development projects.

There is continuous cooperation between the Agricultural Development Fund and the Food Security Authority, by providing loans to importers for targeted products within food security strategies, with the aim of reaching the appropriate stock that covers needs and consumption in the Kingdom.

In this context, and as part of efforts to enhance food security, the Fund signed an agreement to finance a sheep breeding project in Al-Shannan Governorate in the Hail region, with a total value of 1.106 billion riyals, and an investment cost of up to 2 billion riyals, with Al-Rai National Livestock Company.

Table N° 07 : Lending activity of the Agricultural Development Fund for the Rural Development Program by sector 2018-2022 million riyals

Sector	Livestock and sheep farming	Small scale fishers and fish farmers	Beekeepers	Fruit production processing and marketing	Arabica coffee producers	Buld Crops	Flower farming and trade	Smallholder farms and Rural Activities
2019	96	0.344	-	-	-	-	-	-
2020	210	0.310	-	-	-	-	-	-
2021	173	-	1.2	0.537	-	-	-	-
2022	173.6	-	11.7	14.2	71.9	-	-	-

Source : Prepared by researchers based on the annual reports of the Saudi Agricultural Development Fund.

The Fund was keen to diversify its financing programs and include sectors financing all agricultural activities, including the livestock sector, by financing livestock breeding projects in regions of the Kingdom with the aim of enhancing food security and ensuring the stability and sustainability of food supply chains, especially the products targeted in the food security strategy, including red meat.

The Fund also seeks to achieve comprehensive agricultural economic growth and contribute to achieving food security and its sustainability, by encouraging and supporting investment in the main sectors as well as the products targeted in the food security strategy.

We point out the importance of effective partnership with the private sector to help it play its important role and invest in the demand for agricultural products (plants, animals and fish). Which shows that the private sector has a pivotal role in supporting the local stock of food commodities, ensuring the stability of prices and markets, and localizing and using modern technologies in the agricultural sector with the aim of raising production efficiency

and reducing the depletion of natural and energy resources, in addition to developing agricultural marketing and services, raising the level of local content and increasing job opportunities.In this sector.

Table N°08: Number and value of Agricultural Development Fund loans for food security projects 2018-2022

Project type	2018		2019		2020		2021		2022	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
Broiler chicken	926	3.096	30	276.3	13	73.9	22	328.1	15	311.5
Layer chicken	278	736.1	3	50	3	10.4	2	34.1	4	75.3
Greenhouses	-	-	5	123.7	15	380.7	14	383.8	15	149
Fish Farming	23	236.7	-	-	1	0.984	2	22.7	2	13.3
Shrimp Farming	26	625.5	-	-	1	123.8	1	5.9	-	-
Calf and sheep Fattening	179	805.3	1	307	1	11.6	2	1.3	-	-
Dairy Production	70	735	1	115	-	-	1	13.1	-	-
Agricultural inve abroad	-	-	2	644.2	1	95	-	-	1	271.3
Total	1502	6343	42	1213.1	35	706.5	44	494.4	37	830.4

Source : Prepared by researchers based on the annual reports of the Saudi Agricultural Development Fund.

It is expected that the number of livestock inputs, including sheep and goats, will reach one million heads upon completion of the project phases, which will enhance the quality of the food services system in the field of meat in the Kingdom, in addition to contributing to achieving food security and raising self-sufficiency rates, as the self-sufficiency rate of local red meat has reached In the Kingdom to 61%..

6- conclusion:

Food security has become one of the strategic goals that Algeria seeks to achieve, like all countries, by developing strategies and policies similar to the National Plan for Food Security and the Agricultural Plan 2020-2024 to promote the most important vital crops, of which Algeria imports significant quantities and with huge budgets, such as wheat, sugar, and vegetable oils.There is no good in a nation that does not eat what it produces This is with the aim of providing the majority of foodstuffs locally and making them accessible to all members of Algerian society in quantity, quality and appropriateness.

The study reached the following results:

Food security is considered one of the most important foundations of societal security, stability and reassurance for every society, as well as one of the most important

Factors of his political and economic strength and independence.

Algeria records arguably average levels of food security, despite the improvement recorded in some foodstuffs such as vegetables, dates, olives, citrus fruits, and vines.. But it is still subject to a large import of many strategic foodstuffs, such as wheat, sugar, vegetable oils, coffee, milk, and red meat...On the one hand, as well as the high prices of these materials, on the other hand, due to their high prices in international markets or their scarcity, and thus they do not become accessible to all members of society, which exposes national food security to fragility.

Accordingly, in order to strengthen national food security, the study recommends strengthening local agricultural production by making the right decisions and rational agricultural policies to increase crop and livestock productivity through optimal and efficient exploitation of all the enormous capabilities that Algeria possesses through several sub-agricultural policies and measures such as encouraging agricultural investment and providing concessions.The necessary facilities, and developing the necessary infrastructure That is, working to advance the agricultural sector as a priority, ensuring the achievement of its goals, and striking iron in order to achieve food sovereignty.

7- references :

-Boualem REMINI. (2005). *La problématique de L'eau en Algérie.* Alger : Office des publications universitaires.. MADR. (2013). *Le programme Quinquénnal 2015-2019* .
-Abegunde, V.O., Sibanda, M., Obi, A. (2019). The dynamics of climate change adaptation in sub-Saharan Africa: A review of Climate- Smart Agriculture among Small-Scale Farmers. *Climate*, *7*, 1–23.
-Mohammed Al-Sayed Abdelsalam. (February 1998). Food security for the Arab world. Kuwait: National Council for Culture and Literature.
- Akamani, K. (2021). An ecosystem-based approach to climate-smart agriculture with some considerations for social equity. *Agronomy*, *11*(8), 1564. http://dx.doi.org/10.3390/agronomy11081564
-Ezzat Melouk Qenawy. (25 September 2002). Arab food security. Egypt: The Tenth Conference of Agricultural Economists - The Egyptian Association of Agricultural Economics
- Biró, K., Csete, M., & Németh, B. (2021). Climate-smart agriculture: Sleeping beauty of the hungarian agribusiness. *Sustainability*, *13*(18), 10269. http://dx.doi.org/10.3390/su131810269
- Botchway, V.A, et. al. (2016). Climate-Smart Agricultural Practices in Ghana. CCAFS Technical Report.Accra, Ghana: Council for Scientific and Industrial Research - Animal Research Institute (CSIR-ARI)
- CIAT, ICRISAT, BFS/USAID. (2020). *Climate-Smart Agriculture in Mali*. CSA Country Profiles forAfrica Series. International Center for Tropical Agriculture (CIAT); Bureau for Food Security, United StatesAgency for International Development (BFS/USAID), Washington, D.C.
- Diko, S.K. (2018). Toward integration: managing the divergence between national climate change interventions and urban planning in Ghana. In: Adriana G, Colucci A (eds) *Smart, resilient and transition cities: emerging approaches and tools for a climate-sensitive urban development*. Elsevier, Amsterdam, 141–152.
- Diko, S.K., et al. Are local development plans mainstreaming climate-smart agriculture? A mixed-contentanalysis of medium-term development plans in semi-arid Ghana. *Socio Ecol Pract Res* 3**,** 185–206 (2021)https://doi.org/10.1007/s42532-021-00079-2
- Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN), & Earth System Governance Project. (2017). *Climate-Smart Agriculture in the DRC*. Food, Agriculture, and Natural
Resources Policy Analysis Network (FANRPAN). http://www.jstor.org/stable/resrep16466
- Hufkens, et al. (2020), Historical aerial surveys map long-term changes of Forest cover and structure in the Central Congo basin, *Remote Sensing*, *12*(4),1-26
-Bedrani .S & Chriet .F : Quelques éléments pour un bilan d'un demi-siècle de politiques agricoles et rurales. Les cahiers du CREAD 100-2012.
- Chebbi.H & Lachaal. L : l'Agriculture & la sécurité alimentaire : une étude comparative des pays du Maghreb. NewMedit 3/2004.
- Chehat,F : La filière blés en Algérie. les cahiers du CREAD 79-80/2007.

- Djaouti,M : Renforcement des acteurs de la filièrecéréales en Algérie dans le cadre d'un partenariat nord-sud – cas de la wilaya de Sétif .Master of science . IAMM 2010.
- Dubois : Le défi alimentaire : Etudegéopolitique et géoéconomique des agricultures mondiales. Puf. Paris, 2011
- Benziouche.S 2020: L'analyse de L'impact des Politiques Agricoles sur la Production des Dattes en Algérie par la Matrice D'analyse des Politiques (MAP). International Research Journal of Finance and Economics.2010.