
**Sustainable agricultural development and its impact on achieving food security, the Democratic Republic of
Algeria as a model
For the period 2004-2020**

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Abstract

Agricultural development in the Arab world occupies an important place in many development programs and economic and social reform. Most of the Arab countries, including the Democratic Republic of Algeria, have paid great and joint interest in this issue since the seventies and until the present century. where a group of Arab institutions were established to support agricultural development and enhance food security for the country. The Arab has a large livestock wealth that needs development and more attention. The large fluctuations in food prices have played an important role in rising in the value of food imports during recent years, i.e. from 2019 until now, due to the spread of the virus (COVID-19), which negatively affected Food security for a large number of countries importing agricultural materials. The weakness of agricultural production compared to the demand resulting from population growth in the Arab world leads to resorting to imports to meet the food needs of the population, as agricultural exports constitute only a small percentage of total exports. In order to understand the reasons for the inability of the Arab countries to achieve sustainable agricultural development that helps achieve food security, this research deals with a review of the theoretical concept of sustainable agricultural development and food security by presenting and analyzing the role of some indicators of sustainable agricultural development on some of the food security indicators of the Democratic Republic of Algeria. Highlighting the conclusions and recommendations in the development of the sustainable agricultural sector in order to achieve food security in Algeria, where the most important finding of the researchers is that the Democratic Republic of Algeria has followed a number of successful methods in preserving the soil, environment and water resources, regulating pastures, protecting forests and combating desertification. Researchers, and in general for all Arab countries through this research, the need to follow modern methods in terms of preserving the soil, environment, and water resources, as well as combating desertification and getting rid of old farming methods to achieve better agricultural production that does not deplete natural resources to obtain self-sufficiency for each country in order to achieve its food security.

Keywords: agricultural development, food security, the Democratic Republic of Algeria.

The research is extracted from a master's thesis of the first researcher

Introduction

The agricultural sector is considered one of the most important sectors with high added value and is considered one of the pillars of economic and social development for many developing or developed countries. Agriculture constitutes a major source of food, absorbs a large proportion of the labor force, contributes to the provision of raw materials and intermediate inputs to many industries, and obtains or provides financial resources through export earnings or the replacement of imported agricultural commodities. In order to achieve food security, which is the enjoyment of all people at all times with physical, social, and economic opportunities to obtain sufficient, safe, and nutritious food that meets their food preferences and needs. Therefore, the issue of food security is one of the most important issues of concern to countries and international organizations. As food always remains the first way for groups to achieve continuity and survival. The importance of this issue necessarily emerges, at a time of crises and severe economic tribulations in various countries of the world, as the Arab world lives in a state of food deficit that is increasing day by day. In the Arab world due to the lack of integrated strategic development planning at the national level, the weapon of food subsidies that Western countries use to dominate the economies of countries, the increasing population growth, the limited and misuse of natural agricultural resources, and weak agricultural productivity, all factors that aggravated the food problem in the Arab world. The food gap and the economic dependence of the Arab countries cannot be solved by relying on others or On foreign subsidies, but on self-reliance and insistence on developing and implementing a tight strategy to achieve sustainable agricultural development and Arab food security, which made the strategic choice to get out of the impasse requires achieving sustainable agricultural development.

Research Importance

The importance of the study in the relationship of agricultural sector products to the issue of food security, and shows the inability of a country to produce what it needs for local consumption of various food commodities and importing them from abroad exposes them to many risks. Moreover, the study reveals the nature of agricultural food production in the Arab world through the experience of Algeria and its ability to achieve Food security and bridging the food gap for its population. In addition, to proving that sustainable agricultural development is the direct bridge to achieving food security through the use of various material, technical and natural resources, similar to water resources without depleting them and in ways that work to protect them. To achieve food security for its members and it can be taken as an applicable study model and benefit from it to achieve food security for the Arab countries. It was devoted to reaching the most important conclusions and recommendations which researchers recommend for the purpose of achieving sustainable agricultural development and achieving food security for Arab societies.

Research Problem

The research problem can be formulated through the following question: To what extent can sustainable agricultural development contribute to achieving food security, and the possibility of achieving that agricultural development for all Arab countries?

Research Hypothesis

The research stems from the hypothesis that (sustainable agricultural development has a fundamental impact on achieving food security) and the model of agricultural development in Algeria can be adopted and applied in achieving food security throughout the Arab world.

Research Aims

The research aims to note the importance of the role of agricultural resources in achieving sustainable agricultural development and food security, and to identify the role of sustainable agricultural development indicators to achieve food security. And knowledge of the relationship between sustainable agricultural development and indicators of food security for Algeria. The study also aims to identify the challenges and obstacles facing the achievement of food security, and identifying the reasons behind the food problem and the lack of food security, and then suggesting some appropriate future solutions to solve this problem.

Research Methodology

The nature of the subject and the objectives to be reached made us rely on the descriptive and analytical method.

The First Topic

Theoretical and conceptual framework for sustainable agricultural development and food security

The first requirement - the concept of sustainable agricultural development

The concept of sustainable agricultural development dates back to the eighties of the last century, in response to the growing ideas that local and international agricultural policies and programs must include a range of environmental, economic and social issues, and be broader than the traditional areas of agricultural production and food security, and the importance of agricultural development has been demonstrated.

This was confirmed at the Earth Summit, which was held in Rio de Janeiro in 1992, in the Agenda 21 of the specific programs and actions necessary to encourage sustainable agricultural development, and no one denies the importance of preserving natural resources (land and water) from deterioration, and preserving them for use by future generations.

The concept of sustainable agriculture is an integral part of the concept of sustainable development, and certainly there is no sustainable development without sustainable agriculture, and many concepts of sustainable agricultural development have been received, the most important of which are the following: -

First - the concept of sustainable agricultural development

It is the management and protection of the natural resource base, and preparation for technical and institutional change to ensure the continuous achievement of human needs for current and future generations in terms of quantity and quality. Providing sustainable job opportunities, increasing income and improving the standard of living for all workers in the agricultural sector¹. As for the concept of agricultural development, according to the International Fund for Agricultural Development, it is intended to create improved and more resilient ways of living Preserving natural resources and working within the limits possible to increase their production without prejudice to the work to protect the agricultural sector from exposure to natural, economic and social factors harmful to the sustainability of production, and to strengthen the mechanisms of self-reliance in productive work. Ensuring the participation of the population and promoting the development of human resources to achieve sustainable development². For all poor rural

¹ Ahmed Jabr Salem Al-Salem, The Reality of Sustainable Agricultural Development and Its Requirements in Iraq, University of Basra, College of Administration and Economics, Master's Thesis, 2010, p. 11.

² FAO, Food and Agriculture Organization in its seventy-fifth year: Together we grow, nurture and be sustainable, Rome, 2020, p. 10

people, including smallholder farmers and workers who own small plots of land or who do not own any land, but without undermining the rule Natural Resources, and it aims to eradicate poverty and end hunger³.

Second - sustainable agricultural development goals

Sustainable agricultural development depends on the human factor and its advanced capabilities and skills in the agricultural production process. Rural development is the other face of agricultural development, hence the importance of experience, efficiency and training in the process of expanding agricultural land investment and increasing its production in quantity and quality, which affects economic development by providing food needs for the population, and achieving food security and securing the future needs of the current generations. These goals are summarized as follows:

- 1- Securing the citizens' needs for food. Human societies are subject to the law of continuous development in terms of increasing their numbers and in terms of the diversity of their cultures. This results in a continuous increase in the demand for agricultural commodities, both plant and animal. Therefore, securing food becomes the first job in the list of priorities. On the contrary, any deficit in meeting demand will result in more agricultural imports from other countries. Which will result in a deficit in the trade balance. Avoiding this deficit depends on the ability to produce it. Moreover, food is no longer an ordinary commodity, especially cereals. It has a strategic perspective that falls under the door of food security, which is one of the tools of war during regional crises⁴.
- 2- The contribution of the agricultural sector to the formation of the GDP. Agriculture is one of the vital sectors and one of the pillars of economic and social development in many Arab countries. It constitutes the main source of sustenance for a large portion of the population, contributing to the employment of more than 27 million workers, or about 23% of Arab labor. This sector also contributes to providing food products and intermediate inputs to many industries, especially food. It contributes to the provision of foreign exchange through the return on exports of agricultural commodities. The economic and social importance of this sector is also reflected in the contribution of agricultural output to the GDP of Arab countries⁵.
- 3- The contribution of the agricultural sector to raising the income level of the population: Increasing agricultural productivity and nutrition is a necessary but not sufficient condition for the development of the sector in a sustainable manner with the aim of improving farmers' incomes and enhancing food security. For example, measures to introduce efficient agricultural techniques (e.g. to increase crops and livestock production) will not succeed unless they are accompanied by capacity building. Localization is done in an effective manner through training and extension programmes, and development measures to improve agricultural productivity can fail unless supplemented by necessary services such as agricultural marketing, rural credit and microfinance. Success in implementing an effective sustainable development program requires some complementary improvements to the local infrastructure, such as feeder roads and small-scale irrigation networks. In addition, raising farmers' incomes, reducing poverty in rural areas and improving family food security requires diversifying agricultural production systems⁶.
- 4- The agricultural sector contributes to the preservation of natural resources: Agriculture conserves resources by improving soil health, reducing pest and disease pressure, reducing erosion, increasing water and nutrient availability, and storing carbon in the soil, by enhancing the resilience of crops in the face of high temperatures, droughts and floods, and helping to mitigate Effects of climate change. It also reduces production costs by achieving savings in machinery, labor, irrigation, mineral fertilizers and pesticides. However, conservation agriculture is not one size fits all, as the methods used to achieve its basic practices vary according to different crops and local conditions⁷

³ <https://www.ifad.org/ar/ifad-and-the-sdgs>

⁴ Saleh Hussein Abd al-Salam, Sustainable agricultural development in the province of Hasaka, a geographical study, Damascus University, Faculty of Arts and Humanities, Department of Geography, 2019, p.

⁵ <https://www.arab-api.org/Journal.aspx>

⁶ Fahmi Beshay, Towards sustainable agricultural development in Iraq, Emergency Operations Department, Special Relief Programs Department, (Rome - FAO - 2003), p. 32

⁷ FAO, Food and Agriculture Organization of the United Nations, Conservation and Expansion in Practice, 2016, p. 20

Third - Obstacles to sustainable agricultural development

There are many obstacles that place constraints on this sustainability and may inhibit it. The current obstacles or determinants, which will be available in the future and the opportunity currently available as well as those that will arise in the future, naturally differ from one country to another, and from time to time, and may change in relation to each other according to the efforts made to deal with them. In general, we can look at the obstacles to sustainable agricultural development, the most important of which is the erosion of the natural resource base, as the excessive use of natural resources such as forests, fisheries and fresh water and the high levels of pollution, including greenhouse gas emissions, due to environmental degradation and climate change destroy many of the gains made in development and reduce Poverty over the past decades, including progress towards achieving the Millennium Development Goals. As well as pests and diseases that have ravaged community-intensive chemical input-based agricultural systems all over the world⁸. The other obstacle is population pressure, as the continuous increase in the population, one of the huge problems that the peoples of the world suffer from, is the problem of rapid population growth, and this due to attributed to developments in the environment in various industrial, commercial, food and social fields.

Fourth - Dimensions of sustainable agricultural development, which can be summarized as follows:

- 1- The economic dimension: in the field of food: the Arab region is considered a food deficit area that is compensated by the recovery of basic food commodities from abroad. The Arab countries cannot dispense with some commodities necessary for living such as grains, as well as meat and dairy. This deficit is increasing with time, and reliance on external sources to provide food requirements has become a heavy burden for the Arab countries⁹.
- 2- The social dimension: The difference in the cultural level of the peoples and the values, customs, traditions and behavioral methods that prevail in their societies may have their effects on agricultural products and the way of their production agricultural¹⁰.
- 3- The human development dimension: The experiences of Asian countries show us the possibility of using human energy productively without the presence of additional capital resources. One of the important measures in this field is the reorientation of farmers on the basis of instilling in them the spirit of cooperation, teamwork, trust and altruism. As well as, increasing the capital used in this vital sector and increasing agricultural extension to mobilize farmers and put them in a new position through which they can contribute effectively to the development process agricultural development, culturally and socially¹¹.
- 4- The environmental dimension: That is, it preserves natural resources and increases the vitality of the entire agricultural ecosystem, starting with people, crops and animals, and even soil organisms. This is best ensured by good soil management, and the health of crops, animals and humans through biological processes (self-regulation). This means using local resources in a way that limits the loss of nutrients, biomass and energy and prevents pollution. And includes within this concept the focus on the use of renewable resources¹².

⁸ International Labor Office Geneva, Sustainable development, decent work and green jobs, Fifth Report, Fifth Agenda Item, International Labor Conference, 2012/2013 session, p.1

⁹ arab-ency.com.sy/detail/124

¹⁰ Ahmed Ajaj, Spatial development requirements and their impact on agricultural development, study case, Daraa Governorate, Master's thesis, Damascus University, Faculty of Architectural Engineering, Department of Planning and Environment, 2016, p. 23

¹¹ Fiqh Center for Research and Development, Obstacles to Agricultural Development in the Kingdom of Saudi Arabia, 1997, p. 10

¹² Ghassan Abdel Ismail Abu Mandeel, The funding role of civil society organizations in sustainable agricultural development, a case study of the Gaza sector 1996-2010, Master's thesis, The Islamic University of Gaza, College of Commerce, Department of Development Economics, 2011, p. 30

The second requirement - the theoretical and conceptual framework for food security

First, the concept of food security

The concept of food security dates back to the sixties of the last century, after the occurrence of the global food crisis, which resulted in the convening of the World Food Summit in 1974 in Rome¹³. Definitions of the term food security differed as a result of the different viewpoints of the authors of this term, namely international organizations and bodies, and those who adopted this term from local governments and the most important international organizations that define the concept of food security is the Food and Agriculture Organization of the United Nations (FAO). It defined food security as (the access of all people, at all times, to sufficient food for a healthy and active life¹⁴), and it was also defined (available when All people at all times have physical, social and economic opportunities to obtain sufficient, safe and nutritious food that meets their nutritional needs and food tastes and ensures them to lead a healthy and active life¹⁵)

Second - Food Security Objectives: There are four main objectives of food security:

- 1- Access: means that a person has the resources to purchase or obtain food. For example, a person may not have enough money to buy food and pay rent, so he or she must decide which of these basic needs is most vital to survival at that time¹⁶.
- 2- Stability: is usually related to the availability of food or access to food. It requires that food be available to individuals and families at all times¹⁷.
- 3- Availability: which is represented in the presence of different resources or sufficient income in order to obtain food, whether using food aid, home production, or others¹⁸.
- 4- Utilization: The use of food to meet all needs, which requires the provision of supporting infrastructures such as adequate food systems, sanitation, and health care, to reach a state of nutritional well-being, and this dimension clearly shows the importance of non-food inputs in achieving food security¹⁹.

Third- Theoretical relationship between sustainable agricultural development and food security

Food security in a particular country or region is defined as “one of the strategic components of agricultural development, contained within the sustainable economic and social development plan. That includes many policies, programs, and projects that would increase the productivity of basic food commodities through the optimal use of available local resources and the elimination of all forms of loss and damage to all food commodities, starting from the producer to the consumer, rationalizing consumption of all food commodities and improving the terms of trade exchange for those commodities and their production requirements, whether they are export or import while maintaining the environmental balance, and preventing pollution in its various forms and forms, in light of achieving the greatest extent possible. Possible independence and reduce external dependence, aiming to provide these food commodities in sufficient quantity and quality to the entire population in their different areas of presence at prices consistent with their income levels on a continuous and sustainable basis. It is clear from this definition the “organic”

¹³ Al-Sadiq Awad Bashir, Challenges of Arab Food Security, first edition, Beirut, Arab House of Science, Lebanon, 2009.

¹⁴ FAO the state of food and agriculture, food security some microeconomic dimensions, Roma, 1996, p322.

¹⁵ 15- FAO, The State of Food Insecurity in the World, Rome, 2010, p. 8.

¹⁶ - /<https://ffl.org/ar/15159/food-security-food-insecurity>

¹⁷ <http://fsis.sd/SD/AR/FoodSecurity/Pillars/>

¹⁸ Talal Meshaal, The Importance of Food Security for Third World Countries, Topic Website, 2018, p. 2.

¹⁹ / <https://political-encyclopedia.org/dictionary>

relationship between the concept of food security and sustainable agricultural development, and that it is one of its components, Hence, it is not possible to achieve food security without sustainable agricultural development²⁰.

Agricultural development plays an important role in the economies of Arab countries, as it provides food security through sustainable development, as the latter is linked to increasing production and improving it quantitatively and qualitatively, as well as corresponding to this population increase and directing the surplus to export, if any, as well as facing global competition. That is why it has become necessary to use sustainable agricultural development to achieve self-sufficiency and to adopt agricultural policies that raise production and provide food, thus achieving self-sufficiency. The strategy message of the Arab Program for Food Security can be summarized in (enhancing efforts to modernize Arab agriculture, developing its productive and competitive capabilities, developing and maintaining natural resources, and preserving the environment, in a manner that ensures the achievement of the goals of the current and future generations, within an integrated framework that achieves the interests of all Arab countries and with the competitiveness that they can from competition under conditions of free global trade in goods, services, and intellectual property rights²¹)

The second topic

The reality of sustainable agricultural development and food security in the Democratic Republic of Algeria

The first requirement - the reality of sustainable agricultural development in Algeria

The agricultural sector in Algeria has witnessed a great development due to its great importance in achieving economic development, As it contributes to achieving self-sufficiency, reducing unemployment, developing exports and reducing dependency on the outside, especially in terms of food. Because of the low oil prices at the present time, it has become necessary to search for the necessary alternatives to advance the national economy, promote exports outside hydrocarbons and achieve self-sufficiency.

The agricultural sector is one of the most important strategic sectors to which Algeria has attached great importance in recent years, as it is one of the sectors that can contribute to achieving food security, especially in the grain, meat, dairy, vegetable oils, sugar, etc., and it can also contribute to the development of exports outside hydrocarbons from During the international marketing of agricultural products that are characterized by their strong production and quality and need a marketing strategy, as is the case for some vegetables and fruits such as dates. markets.

²⁰ grenc.com/show_article_main.cfm?id=12948

²¹ Muhammad al-Sayyid Abd al-Salam, Food Security for the Arab World, Knowledge World 230, Kuwait, 1987, p. 309.

First - indicators of sustainable agricultural development for Algeria

Table (1) Agricultural development indicators for the Democratic Republic of Algeria for the period 2004-2020

year	Gross Domestic Product (Million Dollars)	Gross agricultural output at current prices (Million Dollars)	Average per capita share of agricultural gross domestic product at current prices(dollars)	Average per capita GDP at current prices (dollars)	manpower			manpower	
					total population (Million people)	Urban population (million people)	Rural population (million people)	total workforce (Thousand people)	agricultural workforce (a thousand people)
2004	84800	7784	240.9	1241.7	32312	.184868	13825.2	7798	2125.5
2005	102800	7900	238.3	1148.5	33156	.199971	8.13159	9493	1381
2006	116600	8812	261.3	1791.7	33722.9	20402.1	.133208	9730.9	1609.6
2007	127497	10325	300.2	2894.7	34400	20716	13684	9968.9	2220.1
2008	171756	11195	321.7	3375.8	34800	20957	13843	10315	2244.1
2009	138126	12820	365.2	3030.7	35100	21130	13970	10544	2358.3
2010	161947	13644	382.6	3740.5	35661.3	21691.3	13970	10544	2358.3
2011	199416.6	16242.6	442.4	5116.5	36717	22747	13970	10662	2442.6
2012	207821.7	18334	488.9	6147.3	37495	23525	13970	11423	2476.5
2013	209415.6	20573.4	537.2	6525.7	38297	24327	13970	11964	2528.9
2014	213343	21966.6	561.6	6518.3	39114.2	29322.2	9792	11454	2550.6
2015	166894	19718	493.4	4863.8	39963	29605.2	10357.8	11931	4959.8
2016	158401.9	19476.7	476.9	4526.7	40836	30423	10413	12117	2545
2017	167574.8	20565.1	492.9	.52009	41721	.275094	14211.6	10858	2608.8
2018	20452.3	20769.5	487.6	5652.3	42600	31236.4	11498	12400	2648.9
2019	153212.3	19982.2	464.1	6000	43053	30510	12543	12716.6	1271.6
2020	149600	20666.5	471.3	4200	43851	32011.3	11839.7	12231.9	1223.2

Preparing researchers based on the statistics data of the League of Arab States, the Arab Organization for Agricultural Development, the Yearbook of Arab Agricultural Statistics and the World Data Atlas

1- Gross Domestic Product and Gross Agricultural Product

From Table (1) the agricultural output increased during the period 2004-2014 at current prices, reaching (21966.6) million dollars in 2014 compared to 2004, which amounted to (7784) million dollars, due to the support of economic activity through diversification of production with support programs. As for the period 2015-2020, it witnessed a varying decrease and rise in the total agricultural output at current prices, but in general, it witnessed a decrease, as it

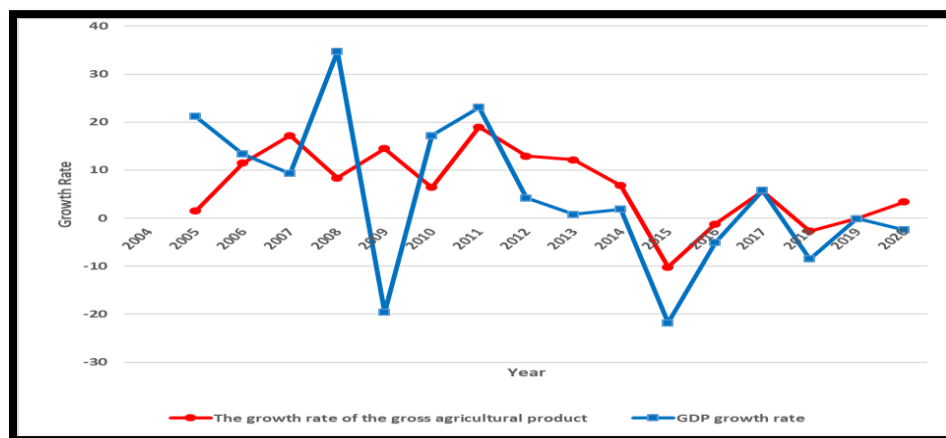
was (20666.5) million dollars in 2020 compared to 2014, which amounted to (21966.6) million dollars, as a result of the deteriorating conditions security, climate fluctuations, low oil prices, as well as the spread of the disease (COVID-19), which has become an obstacle for all countries to the economic growth of all kinds. Despite this, Algeria was able to control its food security due to the diversification of the production base and the increase in the contribution of the non-oil sectors to the generation of GDP. This positive development reflects the relative success of the economic and structural reform policies and programs that the Arab countries have taken the initiative to implement. In addition to the challenges facing the regulation of internal markets, and the effects resulting from fluctuating climatic conditions and their impact on agricultural production. As well as the impact of changes in global oil prices, and the extent of fluctuations in the exchange rates of the dollar and the euro, as they are the two main currencies in Algeria's commercial transactions.

Table (2) Growth rate of sustainable agricultural development indicators for the Democratic Republic of Algeria for the period 2004-2020

year	Growth rate of Gross Domestic Product(%)	Growth rate of Gross agricultural output at current prices(%)	Growth rate of per capita Gross Domestic Product(%)	Growth rate of per capita Gross agricultural output at current prices(%)	The growth rate of the total population (%)	Urban population growth rate (%)	Rural population growth rate (%)	Total labor force growth rate (%)	Agricultural labor force growth rate (%)
2004	-	-	-	-	-	-	-	-	-
2005	21.2	1.5	18.1	-1.1	2.6	8.2	-4.8	21.7	-35.0
2006	13.4	11.5	11.5	9.7	1.7	2.0	1.2	2.5	16.6
2007	9.3	17.2	7.2	14.9	2.0	1.5	2.7	2.4	37.9
2008	34.7	8.4	33.2	7.2	1.2	1.2	1.2	3.5	1.1
2009	-19.6	14.5	-20.3	13.5	0.9	0.8	0.9	2.2	5.1
2010	17.2	6.4	15.4	4.8	1.6	2.7	0.0	0.0	2.6
2011	23.1	19.0	19.6	15.6	3.0	4.9	0.0	1.1	0.9
2012	4.2	12.9	2.1	10.5	2.1	3.4	0.0	7.1	1.4
2013	0.8	12.2	-1.3	9.9	2.1	3.4	0.0	4.7	2.1
2014	1.9	6.8	-0.3	4.5	2.1	20.5	-29.9	-4.3	0.9
2015	-21.8	-10.2	-23.4	-12.1	2.2	1.0	5.8	4.2	94.5
2016	-5.1	-1.2	-7.1	-3.3	2.2	2.8	0.5	-58.4	-48.7
2017	5.8	5.6	3.5	3.4	2.2	-9.6	36.5	118.9	2.5
2018	-8.5	-2.7	-9.6	-3.9	1.2	13.5	-22.7	15.9	-51.7
2019	-0.1	-0.1	-2.0	-2.1	2.0	-2.3	14.1	1.0	1.0
2020	-2.4	3.4	-4.1	1.6	1.9	4.9	-5.6	-3.8	-3.8

Preparing researchers based on the data in Table (1) by using the Eexcel program

Figure (1) Growth rate of GDP and agricultural gross domestic product of the Democratic Republic of Algeria for the period 2004-2020



Preparing researchers based on the data in Table (2) by using the Eexcel program

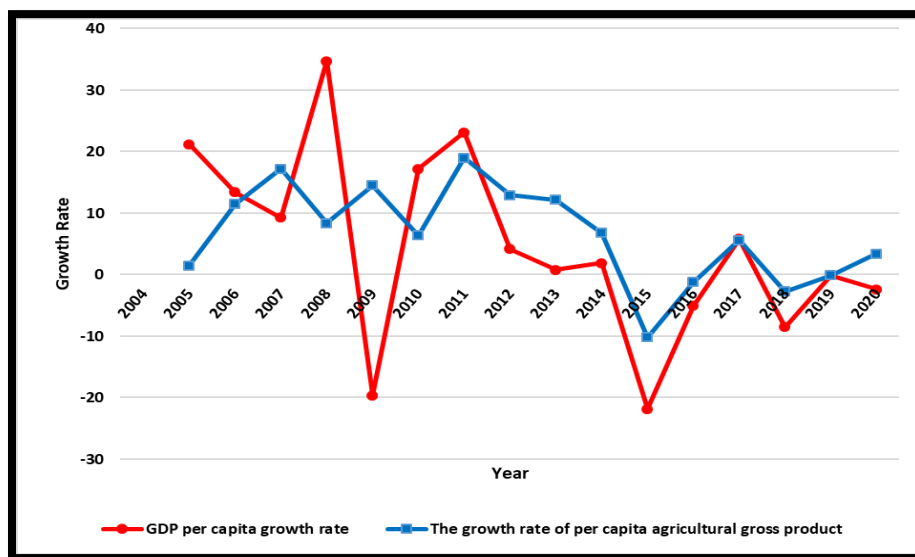
From Figure (1) we note the highest growth rate of GDP at current prices in 2008 amounted to (34.7%), while the highest growth rate of agricultural gross product at current prices was in 2011 (19%).

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2- Per capita GDP and agricultural gross product

from Table (1) We note the period 2004-2014 the increase in per capita GDP and total agricultural product at varying rates due to the reasons mentioned above in addition to the participation of the private sector in raising the output GDP by industrial and agricultural activities. During the period 2015-2016, the per capita share of GDP and agricultural output decreased for the same reasons. In the period 2017-2020, we notice a decrease in per capita GDP at current prices, which amounted to (3411.6) dollars in 2020 compared to 2017, when it was (4016.6) dollars for the decrease in the gross domestic product. As for the per capita share of the agricultural gross product for the same period, it decreased despite the increase in the total agricultural output, as it reached (471.3) dollars in 2020 compared to 2017, it amounted to (492.9) dollars, due to the decrease in the price of the US dollar and the decrease in oil prices and the lack of Imported by oil-importing countries. In conclusion, the diversification of revenues through the participation of industries, in particular by private sector companies, led to a decrease in the total agricultural product and led a decrease in the average per capita share of the total agricultural product despite the increase in the gross domestic product.

Figure (2) Growth rate of average per capita GDP and total agricultural output at current prices of the Democratic Republic of Algeria for the period 2004-2020



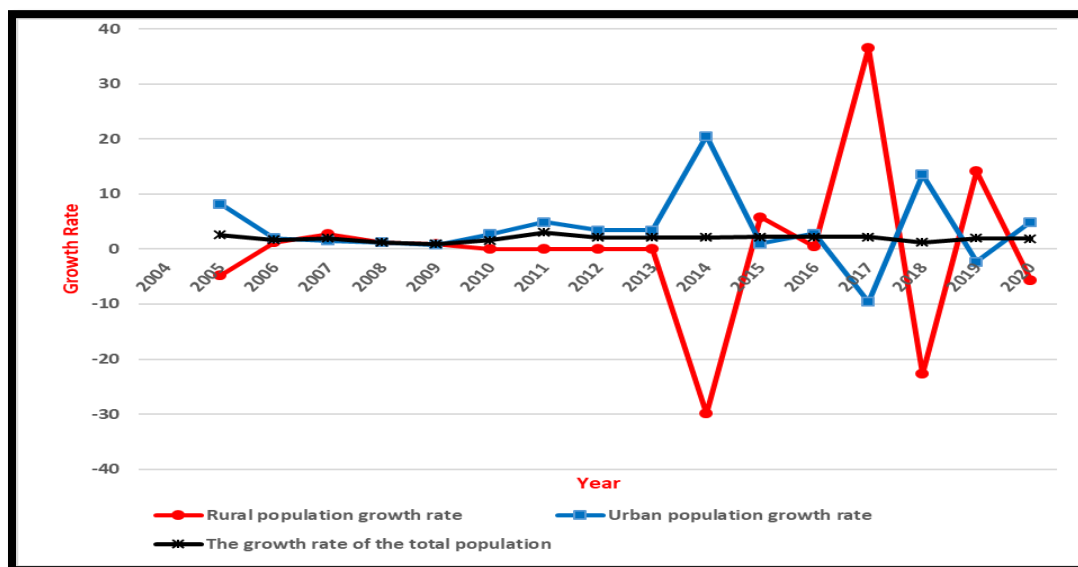
Preparing researchers based on the data in Table (2) using the Excel program

From Figure (2) the highest growth rate of the average per capita GDP at current prices in 2008 amounted to (33.2%), and the highest growth rate of the average per capita of the gross agricultural product was in 2011 it reached (15.6%).

3- The number of population and labor force in the agricultural sector

from Table (1) We note that the urban population in Algeria is greater than the number of the rural population despite the continuous increase in the total population, as the total population in 2020 reached (43851) million people compared to In 2004, it amounted to (32312) million people, and the urban population in 2004 (18486.8) million people, and the rural population (13825.2) million people, that is, the urban population exceeds the rural population (4661.6) million people, as well as the rest of the years of study, we find a big difference between them this It negatively affects the agricultural labor force, and the reason for this is due to the failure of the rural housing policy method, i.e. the introduction of social, school and health facilities, road construction and rural electrification. Algerian agriculture still suffers from its traditional crises in the lack of production, and rural people are still unstable in their relations with the land as a permanent, guaranteed profession and guarantor for their reproduction. They searched for other sources to supplement their resources outside of agricultural activity, i.e. in urban areas. We also note that the agricultural labor force decreased for the period 2004-2020, reaching (1223.2) million people in 2020 compared to (2125.5) million people in 2004. Urban to engage in business other than agriculture to supplement their resources.

Figure (3) Growth rate of the total population, rural population and urban population of the Democratic Republic of Algeria for the period 2004-2020

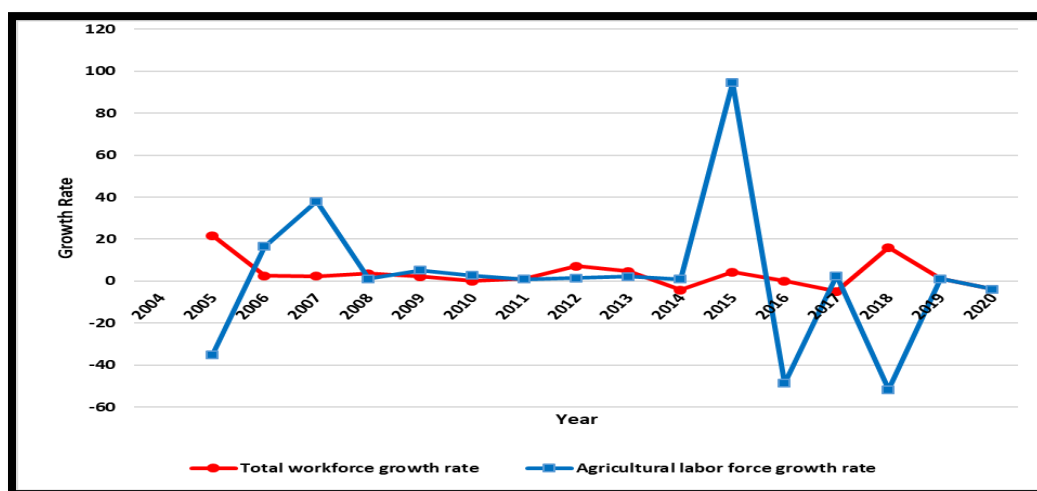


Preparing researchers based on the data in Table (2) using the Excel program

From Figure (3) we note the highest growth rate of the total population in 2011 amounted to (3%), and the highest growth rate of the rural population was in 2017 (36.5%), while the highest growth rate of the urban population was in 2014 it reached (20.5%).

From Figure (4), we note the highest growth rate of the agricultural forces in 2015 amounted to (94.5%), and the highest growth rate of the total workforce in 2017 amounted to (118.9%).

Figure (4) Growth rate of the total and agricultural labor force of the Democratic Republic of Algeria for the period 2004-2020



Preparing researchers based on the data in Table (2) using the Excel program

Second- Indicators of food security in the Democratic Republic of Algeria

Algeria is considered among the countries that suffer from a deficit in its food security, and during the recent period the interest in the problem of food security has increased after reliance on importing food from abroad has become one of the prominent features of the Algerian economy, which increases the size of its food dependency abroad, and this constitutes a great danger to the Algerian economy. Below are some of the most important indicators:

1-Plant production

Algeria has witnessed interventions with great resonance by the agricultural program, including returning the soil to its previous uses, by concentrating the cultivation of grain in areas suitable for it and reusing the previously exploited land to some dry or drought-prone lands, by compensating the cultivation of grain by planting trees Fruit that can tolerate drought. Emphasis was also placed on developing the cultivation of (cereals, potatoes, and fruit trees), and there are other objectives of the National Agricultural Development Program represented in doubling the agricultural yield and increasing the yield of agricultural work.

Table (3) The names of the securities of the Democratic Republic of Algeria for the period 2004-2020

year	vegetable production (cereals)		Animal Production		
	Productivity (thousand tons)	Cultivated area (ha)	red meat production (thousand tons)	poultry meat production (thousand tons)	fish production (thousand tons)
2004	4032.8	3000.2	293.6	153.3	103.8
2005	3527.4	2813.5	226.2	168.6	139.8
2006	4017.8	3267.5	212.3	118.7	157.3
2007	3601.9	3056.9	229.7	154.1	157.3
2008	1702.1	1485.2	235.9	142.1	142
2009	5253.2	3243.4	271.6	190.8	132.3
2010	4558.6	2856.4	271.6	190.8	132.3
2011	3727.9	2584.5	267.4	330.3	144.3
2012	5137.2	3063	240.9	365.4	108.2
2013	4912.2	2699.3	242.2	418.4	103.9
2014	3435.2	2509	486.3	284.8	100.2
2015	3760.9	2686.1	525.6	294.4	105.2
2016	2942.3	1855.9	537.7	302.8	102.1
2017	3478.1	3513.4	543.9	529.8	108.3
2018	6065.9	3111.4	529	540	120.4
2019	6100	600	150	295	104.9
2020	4900	600	151	352	111.2

Preparing researchers based on the statistics data of the League of Arab States, the Arab Organization for Agricultural Development, the Yearbook of Arab Agricultural Statistics

From Table (3) we note the increase in grain productivity in Algeria during the period 2004-2020, reaching (4900) thousand tons in 2020 compared to 2004, which amounted to (4032.8) thousand tons. This increase is attributed primarily to the expansion of reclamation operations. Agricultural lands, where many farmers have received concession contracts for agricultural lands that they have benefited from for years, on the one hand, and on the other hand, ensuring the marketing of the grain crop.

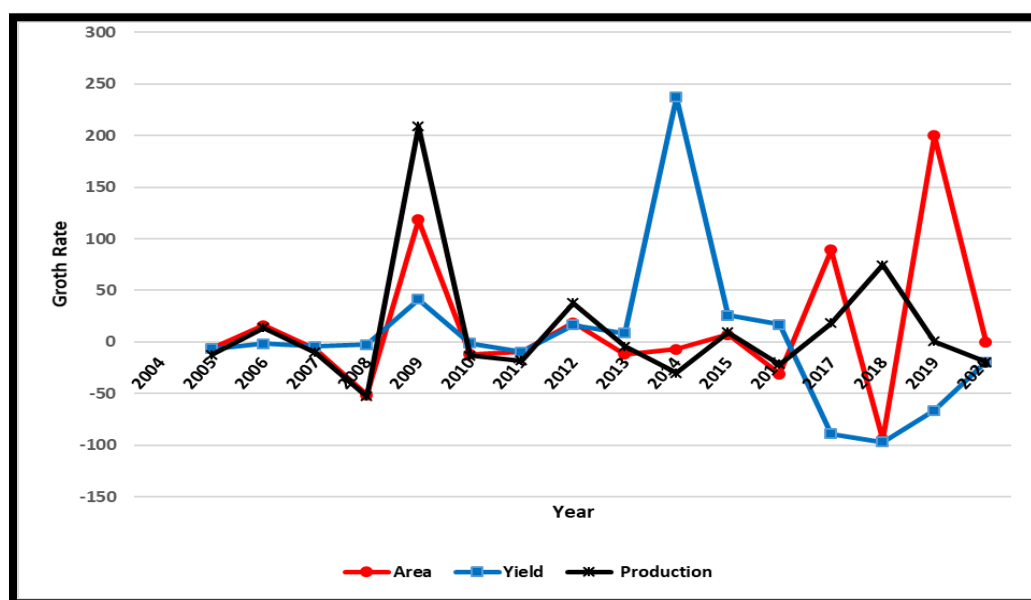
Table (4) Growth rate of food security indicators for the Democratic Republic of Algeria for the period 2004-2020

year	Grain production growth (%) rate	Red meat production growth (%) rate	Poultry meat production growth (%) rate	Fish production growth rate (%)
2004	-	-	-	-

2005	-12.5	-23.0	10.0	34.7
2006	13.9	-6.1	-29.6	12.5
2007	-10.4	8.2	29.8	0.0
2008	-52.7	2.7	-7.8	-9.7
2009	208.6	15.1	34.3	-6.8
2010	-13.2	0.0	0.0	0.0
2011	-18.2	-1.5	73.1	9.1
2012	37.8	-9.9	10.6	-25.0
2013	-4.4	0.5	14.5	-4.0
2014	-30.1	100.8	-31.9	-3.6
2015	9.5	8.1	3.4	5.0
2016	-21.8	2.3	2.9	-2.9
2017	18.2	1.2	55.1	6.1
2018	74.4	-71.9	-40.8	11.1
2019	0.6	-2.0	6.1	-12.8
2020	-19.7	0.7	19.3	6.0

Preparing researchers based on the data in Table (3) by using the Eexcel program

Figure (5) Growth rate of the amount of grain production of the Democratic Republic of Algeria for the period 2004-2020



Preparing researchers based on the data in Table (4) using the Excel program

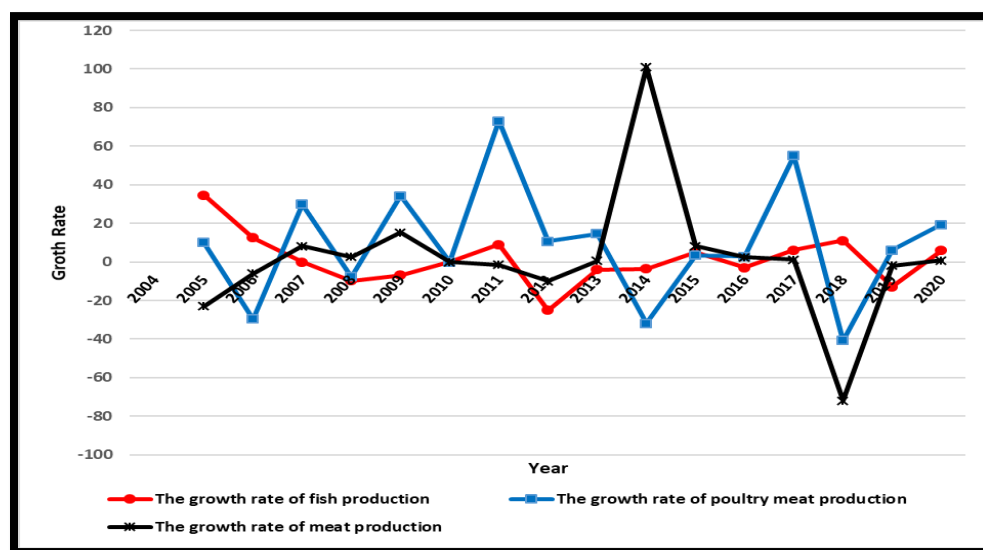
From Figure (5), we notice the highest growth rate of grain production in 2009, which amounted to (208.6%).

2-Livestock production

From Table (3) We note that red meat production decreased during the period 2004-2020, reaching (151) thousand tons in 2020 after it was (293.6) thousand tons in 2004. The farmers justified the decrease in red meat production, with an increase The prices of imported fodder in the international market and shipping costs due to the spread of Covid 19 disease, in addition to the increase in the population, which increased the consumption of red meat because it is an important meal in the population's diet. With regard to poultry meat, it witnessed a significant and continuous increase during the period 2004-2020, reaching (352) thousand tons in 2020 compared to 2004, which amounted to (153.3) thousand tons, thanks to the policy of supporting producers and veterinary accompaniment, in

addition to facilitating the granting of operating loans. Young people were involved in raising broiler chickens, as this led to the development of chicken huts in line with veterinary requirements, and many rural areas were devoted to this type of agricultural activity. We note a decrease in fish production during the period 2004-2020, reaching (111,2) thousand tons in 2020 compared to 2004, which amounted to (103.8) thousand tons. And the government sector in the sector, and the difficult economic and social conditions experienced by fishermen, in addition to the shortage of trained and specialized labor, low marketing services, and weak financing channels and capabilities for fishermen.

Figure (6) Growth rate of livestock production quantities of the Democratic Republic of Algeria for the period 2004-2020



Preparing researchers based on the data in Table (4) using the Excel program

From Figure (6) we note the highest growth rate of red meat in 2014 that amounted to (100.8%), the highest growth rate of poultry meat in 2011 amounted to (73.1%), and the highest growth rate of fish in 2005 amounted to (34.7%).

The second requirement - agricultural development in Algeria and the steps for self-sufficiency

Algerian Republic has taken important steps to enhance food security, establish agricultural development and face the challenges of climate change, including high temperatures and scarcity of water resources. The strategy in local markets and raising the operational efficiency and productivity of agricultural and food systems.

Its objectives were to build a sustainable agricultural sector that contributes to achieving food and water security, and economic, social, and environmental development, which is positively reflected in the general Algerian situation. Through its global, regional and local partnerships, many investments in systems, technologies, and innovations. He added that Algeria is working to strengthen the sectors supporting food systems by developing infrastructure in the

sectors of industries complementing agricultural products and the transport and communications sector, as well as interest in scientific research, industrialization, and agricultural marketing institutions with international quality, as well as offering many investment opportunities to enhance the productivity of the agricultural sector and provide products. He stressed the importance of taking measures and measures in the short and long term to reduce the challenges and pressures facing the agricultural sector, natural resources, and food security as a result of the pandemic that affected many development and economic fields and its indirect effects on agricultural and food systems around the world.

Algeria has distinguished itself in striving to increase agricultural productivity, achieve strategic partnerships, and enhance investment opportunities that cover common areas and support the agricultural sector to achieve food security²². Through the growth rates that were presented in this topic, we noticed a rise and a decline in growth rates, which were caused by various reasons, including economic, political, and natural.

The Third Topic

Conclusions and Recommendations

Through the foregoing, the researchers reached a set of conclusions and recommendations, which are as follows:

First - The Conclusions:

1. Algeria seeks to invest in the agricultural sector to ensure that it achieves food security.

²² <https://www.fao.org/home/ar>

2. Algeria has been interested in getting rid of traditional farming methods that damage its agricultural soil and reduce production as well as damage to the environment.
3. Algeria has used modern technologies in order to preserve water resources in a way that ensures their protection, using advanced irrigation methods to preserve the various water resources in a way that ensures their protection.
4. Algeria took a policy of organizing and preserving pastures through developing them, providing water resources, and reducing pressure on them by concentrating grazing for meat-producing animals in fixed centers.
5. Protecting the natural vegetation cover in Algeria and not destroying it in the wrong way takes great interest from specialists in the agricultural and environmental aspects of Algeria.
6. Organizing the operations of cutting down forests and fighting fires in them for the purpose of protecting the forests.
7. Algeria enacted laws that contribute to combating desertification and protecting the environment and diversity.

Second, Recommendations

1. Arab countries should invest in the agricultural sector to achieve food security for their population.
2. It is necessary for Arab countries to get rid of traditional farming methods that damage their agricultural soil and reduce production, as well as damage to the environment.
3. The use of modern technologies in order to preserve water resources in a manner that ensures their protection, by using advanced irrigation methods to preserve the various water resources in a manner that ensures their protection.
4. The necessity of adopting a policy of regulating and preserving pastures through developing them, providing water resources, and reducing pressure on them by concentrating grazing for meat-producing animals in fixed centers.
5. It is necessary to protect the natural vegetation cover and not to destroy it in the wrong way.
6. Organizing the operations of cutting down forests and fighting fires in them for the purpose of protecting the forests.
7. It is important to issue laws that contribute to combating desertification and protecting the environment and diversity.

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