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The Role of Agriculture in Substainable Development: An Economic Growth Perspective

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Abstract---This research aims to studying the the role of the Agricultural Sector in Sustainable Development and its contribution in Economic Growth in Algeria. The results of the co-integration test according to the Bounds Test indicated a co-integration relationship between the study variables: GDPG, AGVA, AGIMP, AGEXP, FEX and, INDVA, we find that 91% of the real GDP growth changes are explained by independent variables. the results of estimating long-term relationship has shown that the rate of value-added growth in the agricultural sector impact is positive and statistically significant on GDP growth, but all of the imports of agricultural raw materials rate and the rate of food exports had a negative impact, but all of the imports of agricultural raw materials rate and the rate of food exports had a negative impact, but agricultural raw materials exports did not have a statistically significant effect- In contrast the results of estimating the short- term relationship showed the presence of a positive impact and statistically significant rate of value-added agricultural sector growth, but it is weak compared to the impact of the industrial sector, But for the impact of agricultural raw materials exports, it has been a positive impact.

Keywords---Agricultural Sector, Economic Growth, Co-integration, Substainable Development, Algeria.

Introduction

The goal of any economic activity is to try to satisfy these endless needs by using the resources available in the state and carrying out the productive process, by reconciling these resources with the needs required of them. food and agriculture can help achieve multiple Sustainable Development Goals. By nurturing our land and adopting sustainable agriculture, present and future generations will be able to

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feed a growing population. Sustainable food and agriculture have great potential to revitalize the rural landscape, deliver inclusive growth to countries and drive positive change (FAO, 2018). Sustainability is fundamental to achieving future growth in agriculture, Sustainable agriculture comprises site-specific ranching and farming practices designed to meet current and future needs for food, fiber, energy, and ecosystem services including, but not limited to, soil conservation, clean water and biodiversity. Sustainable agriculture emphasizes production and food systems that are profitable, environmentally sound, energy efficient and improve the quality of life for both farmers and the public (Nibeza, S., 2015, PP.162-163).

The development of the agricultural sector allows increasing real per capita income as well as increasing material production directed to meet various human needs, and also leads to an increase in state revenues and facilitates the performance of its tasks and pushes it to search for new technologies in the field of production and defense, through work on building a future strategy. The role of the agricultural sector is crucial in the pursuit of sustainable development goals, The agricultural sector plays a ignificant role in sustainably supplying food, especially in densely populated regions such as city centers. Achieving sustainable development goals by considering the development of the agricultural sector. agriculture has a fundamental role in humanity's survival. Added to this requirement is the increased consumption of natural resources in agricultural production. Agriculture is associated with various problems, such as: the exhaustion of non-renewable natural resources; soil damage; the adverse effects of agricultural chemical products for human and environmental health (Laurett, R., 2021).

Economic theories have been studying and analyzing the mechanism and reasons for achieving the economic well-being of peoples and improving the living standards of members of their societies.therefore, we seek in this study to highlight the role of the Algerian agricultural sector in supporting growth and increasing the well-being of members of society. The agricultural sector in Algeria is one of the most important economic sectors in the country due to its vast green spaces, which are considered one of the finest types of land in the world, and a relative abundance of the necessary resources necessary to achieve Sustainable development at the level of the economy as a whole. This sector can become an engine of growth and the engine of Sustainable development in the country if it is given importance, given the abundance of natural, capital and human resources that Algeria has in this sector, especially if these resources are used and exploited optimally by developing plans to achieve the goal of economic diversification policies. The agricultural sector plays a fundamental role in achieving comprehensive development in any country, as the main role played by this sector depends primarily on the available resourc es (Gilan, 2007, p.34). The agricultural sector, along with the education and health sectors, constitutes vital sectors in realizing multidimensional sustainable development, particularly in the realm of social development, The agricultural sector, in the context of the food system, faced significant defit during the crisis of COVID. The role of technology and innovation in sustainable agriculture is paramount in ensuring the long-term viability and productivity of the agricultural sector. Technology has revolutionized every aspect of agriculture, from crop production to livestock management, and has become an indispensable tool for achieving the Sustainable development in the agricultural sector (Korneeva, E,. & Al, 2023). With the growth of global population and the acceleration of industrialization process, the sustainable development of agriculture has become a general trend of the international community.

The agricultural sector is a prominent activity in the economy of Algeria due to its absorption of a large number of the total size of the labor force, its contribution to the formation of GDP, its satisfaction of food consumption needs, in addition to primary goods and materials that are used as inputs in many manufacturing industries. Thus, it contributes to sustainable development through its role in achieving food security, creating jobs, promoting economic growth, reducing poverty, through the efficient use of Natural Resources, adapting to climate change, and ensuring social and economic justice. The agricultural sector is characterized by its dependence on rains in Algeria, in addition to the limited dependence on modern agricultural methods, which contributed to the low productivity of agricultural

crops. Agricultural production is characterized by instability due to the variability of climatic factors, limited water resources, especially rains. In this context, the study poses the following problem:
To what extent does the role of the agricultural sector in Sustainable Development and its contribution in Economic Growth : A Case Study of Algeria ?

Literature Review

Literature shows agriculture has manifold impacts on sustainable development: Agriculture is providing livelihoods, is feeding the population and supplying raw materials for the other sectors, it can make labour and capital available for the other sectors, it is in itself a market with a big potential, it creates foreign exchange earnings, it determines largely about the health of the environment and people, and also strongly influences poverty rates and equality among people. Thus, the role of agriculture for Economic Growth and development is doubtless a crucial one (Harjer, M., 2020, P.3).

- According to Lewis, economic growth is necessary for development because it enables raising the standard of living, so economic growth means achieving an increase in the average per capita income, the increase should be real, not monetary, and the increase should be in the long term. Kuznets defines economic growth as: a quantitative phenomenon, that is, it represents the constant increase of population and per capita output (Benichi, R,. & Nauschi.M, 1987, p. 44). Long-term economic growth is defined as the rate of increase in GDP, which leads to a high growth rate of per capita income (Alqadir, K., 2012, p.1). In other words, development includes structural changes in society in its various organizational, economic and political dimensions to achieve well-being (Campbell, R,. & al, 1993). therefore, development contains all that economic growth contained in the above-mentioned elements and some call it continuous development. An important source of employment is agriculture, especially in developing countries where it can employ up to 60% of the labor force. It makes a significant contribution to the GDP and is essential for rural development and poverty alleviation. For example, in sub-Saharan Africa, the work force is employed in agriculture, which accounts for almost 60% of GDP (Montaz, A., 2014, P.83). The rapid growth of development over the past few years has led to the emergence of many negative effects that threaten the environment with dangers in order to achieve continuous development that balances the environment and natural resources, that is, growth should take place without the environment hindering the development process, and without development affecting the environmental resource, and thus achieve sustainable development. Sustainable development is becoming a very important issue, Facing global changes such as the global warming, global climate change, as well as other pressing issue (Korneeva, E,. & al, 2021).

- The idea of sustainable development, first introduced by Douglass in 1984, which gained prominence at the end of the 20th century, is applied to agriculture as a system that requires holistic considerations at various levels, including microeconomic, macroeconomic, and global scales (Zhang, K,. & Chen, Z, 2024). Sustainable development is becoming a very important issue. Facing global changes such as the global warming, global climate change, as well as other pressing issue, Sustainable development means meeting the needs of the current generation without harming the ability of future generations, and based on this concept, a reciprocal relationship arose between economic growth and Environmental Protection, and was thus introduced into the core of the development strategy for the benefit of future generations (Hani, 2005, p.06), and the concept of net or green GDP, sometimes called environmentally moderate growth, appeared in the framework of sustainable development. The World Commission on Environment and Development's (WCED) definition of 'sustainable development' is "development that meets the needs of the present without compromising the needs of future generations to meet their own needs".

Agriculture plays a vital role in sustainable development by promoting economic growth, social equity, and environmental health through practices that ensure food security, improve livelihoods, and protect natural resources. Agricultural sector comprises the three major blocks: producers, consumers, and

agri-food markets. The processing sector is also involved in the production of the agri-food products. Therefore, the current debate on the modernization of the agricultural sector with respect to the increasing and evolving needs of the society needs to be discussed from different perspectives. In this section, we overview the major problems and avenues for research relevant to different blocks as discussed above (Peng, B,. & al, 2024). Worldwide, agricultural activity has been the greatest source of financial wealth since the beginning of civilization, generating income and employment for many people. It is estimated that of the world's 7,41 billion inhabitants, 1,3 billion depend directly on agriculture (Laurett, R,. & al, 2021).

- Sustainable agriculture and rural development are integral and necessary components of sustainable development. Sustainable agriculture involves all three pillars of development economic, social and environmental (FAO, 2005, P.4). Agricultural development is the wheel that moves the agricultural sector until it fulfills its assigned role in economic development. agricultural development means a planned and specific increase or administrative growth, and it is only a process of managing growth rates, aimed at increasing the average real per capita income in the long term in rural areas by expanding the area of cultivated land, which is called horizontal development, or by expanding capital intensification and pumping doses of technological progress, which is called vertical development. Agricultural development is the process of developing land, communities and even businesses, provided that they meet the needs of the present without compromising the ability of future generations to meet their needs (Altijani, A., 2016, pp. 17-19). it is concerned with policies and programs that will develop the national agricultural income in a balanced manner with economic plans at the sectoral and national levels. In order to achieve a set of political and social goals for the individual and society as a whole (Gado, 2013, p.8). The new trajectory of agricultural development should take into account the postulates of sustainable development in all countries, with special regard afforded to the developing ones. Obviously, some transitional stages, such as replacing human labor with mechanical power (mechanization of agriculture), cannot be completely omitted. However, it should be noted that at such an early stage of development of agricultural production, some environmental restrictions may emerge (Pawlak, K,. & Kolodziejczak.M, 2020).

The sustainable development of agriculture has also aroused the common concern of governments, enterprises and scholars. Sustainable agriculture can boost farmers' income and productivity while reducing costs, promoting long-term economic stability and resilience (Zhang, K,. & Chen.Z, 2024).
- Agriculture represents a strategic importance in the economy of any country in the processes of agricultural and industrial production and consumption and an important source of export and obtaining hard currency to achieve the self-sufficiency that any country aims for. The (FAO) defines the concept of sustainable agriculture as follows: "the management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations" (Boros, A,. & al, 2024). In other words, sustainable agriculture should meet the present and future generations' needs by efficiently managing resources. At the same time, it should conserve and improve the quality of thenatural environment and farmers' quality of life (Fairtrade, 2022, P.9). The approach of a sustainable agriculture is intended to enhance sustainable development in agriculture, fishing and the sectors of sylviculture that preserve the land, water, plants and animal genetic, non degrading, technically appropriate, economically viable and socially acceptable resources (Vorley, B., & Feret.S, 2001, P.13). Sustainable agriculture is coming to focus more and more on how it affects the environmental, economic, and social pillars of sustainability. For evaluating food system sustainability at the national and international levels as well as for figuring out sustainable agricultural intensification at the farm level (Bi, A.Z,. & al., 2024, P.1434).

The agricultural industry is an important source of employment, reducing unemployment, especially in rural areas, and a large labor market. Agriculture is a source of raw materials for many industries, there are many agricultural industries based on agricultural raw materials such as vegetable oil, textile and

other industries, the diversity of agricultural raw materials leads to many areas for workers, increase national income and raise the standard of living of community members. Agriculture has long been a source of industrialization and development in many countries, as well as the utilization of the agricultural surplus for industrial exploitation outside the rural sector, which largely depends on the extent to which agriculture has reached technological progress, the prevailing agricultural tenure systems, the prevailing trend in income distribution and the propensity to save. The availability of investment opportunities outside the agricultural sector is based on the fact that the level of income from agriculture and productive merit are the main factors for the availability of surplus income for saving, and the more diverse the sources and sectors of the economy in the state, the less it depends on agriculture as a source of capital. The number of rural workers is also related to the amount or level of technical progress.at the initial stage of economic development, a large amount of labor available to capital is used, which means a decrease in the productivity of the agricultural worker. at the advanced stage of development, the use of agricultural technical means increases, which means an increase in the proportion of capital used for Labor, an increase in labor results, and a decrease in the agricultural labor force.

The more agriculture develops, the more capital goods it needs, such as machinery, fertilizers and chemical pesticides, this helps to increase the production volume of these goods and the economic activities produced by them, as well as industrial (household) consumer goods.the contribution of Agriculture in this area depends on the increase in production progress and income, and the importance of the agricultural sector as a consumer of consumer goods.

An increase in the level of agricultural production leads to the formation of a production surplus, whether at the food or industrial level, after meeting the need for domestic consumption, so that this surplus production can be exported abroad, increase foreign exchange and raise the country's reserves of hard currency, which helps in the establishment of various fields of industry (Gado, 2013, pp. 9-14).
The terminology of sustainable agriculture and agricultural development provides a clear picture of the urgency of the existence of SDGs as a globally agreed-upon development planning ramework. Sustainable agriculture discusses various conditions and environmental impacts caused by griculture in both general and specific terms, simultaneously understanding the environmental conditions that can influence agricultural development (Abdurrahman, A,. & Mutaali.L, 2024 , P.323). the sustainable agricultural practices include several important aspects. The first one is the precision agriculture that has emerged as a promising approach to optimize resource use and enhance productivity (Table 1):

Table 1. Main aspects for the sustainable development of the agricultural sector

Aspect	Description
Precision agriculture	Technology-driven approach optimizing resource use, enhancing productivity, and reducing environmental impacts
Agroecology	Integrating ecological principles, promoting biodiversity, soil health, and minimizing chemical inputs
Digital technologies	Internet of Things (IoT) and Blockchain technology enabling real-time monitoring, data analysis, and traceability
Sustainable agriculture	Government policies incentivizing sustainable practices, regulatory frameworks, and research support
Public-Private Partnerships (PPP)	Collaboration among stakeholders to promote knowledge sharing, technology transfer, and capacity building

Source: Korneeva, E,. & al,. (2023), P.3.

The basis for the development of sustainable agriculture is the use of modern technology that is adapted to the ecological conditions of the country. Innovations in agriculture should lead to the preservation of natural resources, provide a balanced level of supply and demand for agriculturalproducts, as well as motivate the agricultural population, the scientific sector and other participants in the chain of agricultural production and trade. Thus, productivity growth and overall agricultural development cannot be separated from the development of other sectors (Aničić, J,. & al., 2025, P.166).

Government policies are crucial in promoting sustainable agriculture, addressing challenges and ensuring food security. They offer financial incentives and subsidies to encourage farmers to adopt eco-friendly practices, such as eco-friendly technologies and organic farming. Governments also enforce environmental standards and regulations, ensuring sustainable agricultural activities. They invest in research and development initiatives to enhance productivity and reduce environmental effects. Government policies also promote education and raise awareness about sustainable agriculture, empowering farmers with the skills to adopt sustainable practices. Sustainable resource management, soil conservation, and transitioning to renewable energy sources are essential for long-term development and sustainability in the agricultural sector (Montaz.A,. 2014, P.85).

Empirical Evidence

Among the most important previous studies on this topic we find:
- A study by researcher Jaber Abu Jamia entitled The contribution of the agricultural and industrial sector to the economic growth and development in the Palestinian economy (1968-2012) (Jamia, October 2008):
The aim of this study was to highlight the contribution of the agricultural and industrial sector to achieving economic growth and development in Palestine during the period 1968-2012. A model linking economic growth and economic development and the contribution of the two main production sectors, agriculture and industry, was estimated using the least squares method after showing the instability of the study variables. the results of the assessment showed a positive and statistically significant contribution of the industrial sector compared to the agricultural sector on economic growth. in contrast, it was concluded that only the agricultural sector has a significant impact on economic development.

- A study by researchers Feyisayo H.O, A. A. Ihuoma, E.A. Ojoko, titled The impact of the agricultural and industrial sectors on the economic development of Nigeria (Feyisayo H.O, & al., 2015, pp. 73-81):
This study aims to verify the impact of the agricultural and industrial sector on the economic development in Nigeria during the euphoria (1981-2012), the results of the estimation showed a common integration relationship between the study variables, namely per capita real GDP, agricultural contribution to per capita real GDP, industrial contribution to per capita real GDP, interest rate, inflation rate, the results of the estimation showed a statistically significant and positive impact of both agricultural and industrial contribution to per capita real GDP on economic development during the short and long term, and this research indicates that there a need for government And private investors to focus their attention on these sectors to strengthen the national economy and make more effort to diversify the economy, where the focus should not be on the export of crude oil only but to exert more efforts in the field of Agriculture and industrial development. This would translate into meaningful development in these sectors creating jobs, boosting productivity and increasing agricultural production for exports.

- A study by researchers Mirza Md. Moyenuddin titled the causal relationship between agriculture, industry, services and GDP growth in Bangladesh a standard study (Uddin, M., 2015):
This study aims to test the contribution of the agriculture, industry and services sectors to economic growth in Bangladesh using annual data during the period (1980-2013), the results of the estimation

showed that there is a linear and significant relationship statistics for each of those economic sectors and economic growth, Johansson's joint integration test showed a long-term equilibrium relationship between value added variables as a percentage of GDP for both the agricultural, industrial and tourism sector and the GDP variable, while Granger's causality test showed a causal relationship in two directions between the agricultural sector and economic growth, as shown by the Granger a one-way causal relationship of It was also concluded that strategies should be developed to attract more foreign investments to the industrial and agricultural sectors to contribute to GDP growth, as the three previous sectors are closely related to each other and any changes in strategy in any sector will affect the economy as a whole.

- A study by researchers Wang Xuezhen, Wu Shilei and Gao feng titled The relationship between economic growth and agricultural growth, the case of China 2010 (Xuezhen, W,. & al., 2010):
This research paper aims to analyze the relationship between agriculture and economic development in China during the period (1952-2007). the results of estimating the standard model have shown a positive relationship between agricultural and economic growth. the study also concluded that although the share of Agriculture in GDP has decreased significantly over time, the contribution of agricultural growth has maintained an upward trend, it was concluded that strong economic growth does not necessarily need a higher GDP growth rate in the agricultural sector. China should also have the strength to enter the stage of the agricultural care industry. The promotion of agricultural contributions needs to continue to promote the transfer of rural labor, raise the level of consumption of rural residents, promote export and increase the income of farmers so that the national economy develops rapidly and in an orderly manner.

- A study by researchers Festus Victor Bekun, KamilSertoğlu, SevinUgural entitled The contribution of the agricultural sector to economic growth in Nigeria (Bekun,F.V,. & al., 2017, pp. 547-552):
This research aims to analyze the impact of the agricultural sector on economic growth in Nigeria, using annual data from 1981 to 2013. The results of the joint integration test revealed a long-term equilibrium relationship between real GDP, agricultural production and Oilrent oil rents. The error correction model showed that the speed of adjustment of variables towards the long-term equilibrium trajectory was low, although agricultural production had a positive effect on economic growth. It was recommended that the government and policy makers should initiate diversification and promote further allocation in terms of budgeting for the agricultural sector.

Data and Methodology

The research is focused on Algeria, through this study, we will assess the impact of the agricultural sector on achieving economic growth in Algeria. Based on previous studies and I was based on data available by the World Bank from 1990 until 2017. Using EVIEWS 10 Software program. Information had been analyzed in the form of Time-Series statistics to assess the impact of the agricultural sector on economic growth.

The Time-Series data model used in this study covered the years 1990-2017. Time-Series data were collected from the World Bank, such as GDP growth rate, the growth rate of value added of the agricultural sector, percentage of agricultural raw materials exports from commodity exports, percentage of imports of agricultural raw materials from imports of goods, percentage of food exports of commodity exports, and the growth rate of value added in the industrial sector. Utilize Time-Series data to analyze the relationship between agricultural Sector and Economic Growth in achieving the sustainable development. To rationalize the objective of the study, data were collected from Algeria. from 1990 to 2017 in time series.

- Research problem of this study is to cleary the relationship beteen the GDP and the variables: value added of the agricultural sector, agricultural raw materials exports, imports of agricultural raw materials,

food exports and value added in the industrial sector, that is a significant issue in economics. Researchers want to study and understant how the effectiveness and the role of these indicators to influence Economic Growth and achieving the Substainable Development.

- As hypothesis of this research, the variabes: value added of the agricultural sector, agricultural raw materials exports, imports of agricultural raw materials, food exports and value added in the industrial sector, are positively contributes to GDP growth rate. This study aims to highlight these relationship and analyse their impact from 1990 to 2017, Which aims to provide recommendations to decision makers to develop strategies and economic policies, that increase economic growth and achieve sustainable development.
- The model of the study to be evaluated, which expresses the impact of the agricultural sector on achieving economic growth, is as follows:

GDPG = f (AGVA, AGEXP, AGIMP, FEXP, INDVA)
The dependent variable:
GDPG: GDP growth rate (%)

Independent variables:
AGVA: the growth rate of value added of the agricultural sector (%)
AGEXP: percentage of agricultural raw materials exports from commodity exports (%)
AGIMP: percentage of imports of agricultural raw materials from imports of goods (%)
FEXP: percentage of food exports of commodity exports (%)
INDVA: the growth rate of value added in the industrial sector (%)

Results and Discussion

- stability study of time series: of the Phillips-Perron stability level test indicates that only the value-added growth rate of the agricultural sector and the percentage of exports of agricultural materials from the total exports of goods are stable at the level because the probability corresponding to the Phillips Peru test is less than the 5% and 1% morale limit in the three models, while the rest of the time series The probability corresponding to this test was greater than the 5% and 1% morale limit, and therefore the transition to the stability test is carried out in the first differences (This is presented in table 2).

Table 2. testing the stability of the Phillips-Perron Phillips-Perron time series at the level

Variables	Constants and Trend	Constant	Without Constant and Trend
AGVA	0.0000	0.0000	0.0000
AGIMP	0.0001	0.0660	0.0011
AGEXP	0.5445	0.2323	0.3905
FEXP	0.4892	0.1901	0.4136
INDVA	0.1563	0.0658	0.0947
GDPG	0.1053	0.0342	0.1485

Source: Based on EVIEWS 10 software.

The results of the stability test in the first differentials indicate that all those time series are stable in the first differentials, where the probability corresponding to the Philips-Perot test was below the limit of significance (This is presented in table 3). Thus, we conclude that there are time series that are stable in the plane and others that are stable in the first differentials and we write:

AGVA→I(0) , AGIMP→I(0), AGEXP→I(1)I(1),→FEXP INDVA→I(1) ,GDPG→I(1),

Table 3. Stability test of the Phillips-Perron time series in the first differencing

variables	Constants and Trend	Constant	WithoutConstant and Trend
AGEXP	0.0000	0.0000	0.0000
FEXP	0.0000	0.0000	0.0000
INDVA	0.0000	0.0000	0.0000
GDPG	0.0000	0.0000	0.0000

Source: Based on EVIEWS 10 software.

Border method Test (Bounds test) for co-integration test: The Bounds test is based on comparing the calculated Fisher statistic with the critical values of both perasan and Al (2001) (upper limit and lower limit) so that three cases can be distinguished:

The presence of a combination of the stability of time series in the level and in the first differences makes there a possibility of a common integration relationship between these time series (a long-term relationship). considering that the Johansson test of co-integration is impossible to perform because time series are not integrated (stable) of the same degree, the boundary method test is considered the most appropriate, the results of the bounds Test co-integration test (This is presented in table 4) indicate the rejection of the null hypothesis and acceptance of the alternative hypothesis that there is a co-integration relationship between the dependent variable, which represents the real GDP rate, and the rest of the independent variables so that the calculated Fisher statistic was greater than the upper limit at various degrees of significance. (This is presented in table 4).

Table 4. results of the bounds Test co-integration test

F-Bounds Test	Null hypothesis: there is no co-integration relationship		
	Level	Lower Bound I(0)	Upper Bound I(1)
F-statistic =7.70	%10	2.26	3.35
	%5	2.62	3.79
	%2.5	2.96	4.18
	%1	3.41	4.68

Source: Based on EVIEWS 10 software.

* The calculated value of the Fisher test is greater than the upper limit: there exists a common integration relation ;
* The calculated Fisher Test value is less than the minimum: there is no joint integration relationship ;
* The value of the Fisher test calculated between the minimum and the upper limit: there is no result.

. The results of estimating the coefficients of a long-term relationship:
- The co-integration Vector can be written as :
EC = GDPG - (0.114*AGVA + 5.739*AGEXP -0.451*AGIMP -1.874*FEXP+ 0.5013*INDVA)
From the results of the estimation in the above table, we note that most of the transactions were significantly different from zero, where the probability corresponding to the student statistic was below the limit of 5% and 10%, with the exception of the coefficient of the rate of exports of agricultural raw materials as a percentage of total exports. The variable of the value added growth rate of the agricultural sector has had a positive and statistically significant impact, as the latter increases by 01%, the GDP growth increases by 0.114% in the long run, while the rate of imports of agricultural raw materials as a percentage of total commodity imports has had a negative and average impact on GDP growth, as the

former increases by 0.1%, the latter decreases by 0.45%, and in the same direction in the long run, we find that the rate of food exports as a percentage of total commodity exports had a negative impact on the GDP growth rate which raises the feasibility of exports and imports of the agricultural sector in contributing positively to economic growth This may indicate the ineffectiveness of policies related to the agricultural sector in achieving the most important goals of economic policy, which is economic growth. Despite all the development measures and programs adopted by the government within the framework of various economic development programs that affected the agricultural sector, from the economic recovery program (2001-2004) to the growth consolidation program (2015-2019).

It is noted that the impact of the industrial sector in the long term represented by the value-added growth rate index was greater than the impact of the agricultural sector, which indicates the great attention paid by the state to the industrial sector compared to the agricultural sector, as the rate of Value-Added growth of the industrial sector increases by 01%, the GDP growth increases positively by 0.629%.

. Error correction model estimation results: The corrected coefficient of determination indicates that 91% of the changes in GDP per capita growth are explained by independent variables and the rest of the changes are due to non-apparent random factors. (This is presented in table 5).

Table 5. results of estimating the coefficients of the co-integration relationship

Variables	Coefficient	t- statistic	Prob.
AGVA	0.114	3.085446	0.006
AGEXP	5.73	0.647792	0.525
AGIMP	-0.45	-1.811649	0.087
FEXP	-1.874	-2.333091	0.032
INDVA	0.501	3.898339	0.001

Source: Based on EVIEWS 10 software.

Through the corrected determination coefficient: The model (ARDL) approach was proposed by Shin (1995) and Pesaran et al (1996) since the ARDL model is equivalent to a single dynamic model having the same form as the ECM error correction model.

-we find that 91% of the real GDP growth changes are explained by independent variables in the model (presented in the table 6), which is close to one, which indicates the quality of the estimated model, and we also note through the results of the estimation that the error correction limit coefficient is statistically significant, where the probability corresponding to the student statistic was less than the for the rest of the transactions, they were all statistically significant.

The results of the estimation indicate that there is a positive impact of the value-added growth rate of the agricultural sector, as the latter increases by 01%, GDP growth increases by 0.08% in the short term, which is a very weak impact compared to the impact of the industrial sector in the long term represented by the value-added Growth Rate Index, which had a very significant and significant impact compared to the impact of the agricultural sector, where this result corresponds to what was achieved in the long term, as the value-added growth rate of the industrial sector increases by 01%, GDP growth increases positively by 0.81%. As for the impact of exports of agricultural raw materials, its impact was positive, but exaggerated in terms of value. The rest of the variables showed no effect in the short term and their effect was limited only in the long term.

Table 6. Estimation results of the error correction model according to the model ARDL.

Variables	Coefficient	t- statistic	**Prob.**
C	2.72	7.15	0.00
D(AGVA)	0.08	6.91	0.00
D(AGEXP)	20.62	3.12	0.00
D(INDVA)	0.81	13.79	0.00
CointEq(-1)*	-1.00	-7.73	0.000
Adjusted R-squared	0.91		
F-statistic		68.01	

Source: Based on EVIEWS 10 software.

Testing the validity of the estimated model: Testing the autocorrelation of the remainder of the estimated model: Through the gate autocorrelation test breusch-Godfrey Serial Correlation LM, we find that the probability corresponding to this test is equal to 0.32, which is greater than the threshold of significance 0.05, and therefore we accept the null hypothesis that the autocorrelation between the gates does not differ from zero and reject the alternative hypothesis. (This is presented in table 7).

Table 7. Breusch-Godfrey Serial Correlation LM
Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.202856	Prob. F(2,15)	0.3277
Obs*R-squared	3.731777	Prob. Chi-Square(2)	0.1548

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 09/27/2019 Time: 23:25
Sample: 1991 2017
Included observations: 27
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPG(-1)	0.350131	0.319379	1.096287	0.2902
AGVA	-0.017823	0.022823	-0.780906	0.4470
AGVA(-1)	-0.034438	0.033403	-1.030960	0.3189
AGEXP	-7.663799	12.67570	-0.604606	0.5545
AGEXP(-1)	6.397447	11.67259	0.548074	0.5917
AGIMP	0.161780	0.285467	0.566722	0.5793
FEXP	0.243433	0.618168	0.393798	0.6993
INDVA	-0.020563	0.095009	-0.216434	0.8316
INDVA(-1)	-0.232491	0.234228	-0.992581	0.3367
C	-0.509432	0.866712	-0.587775	0.5654
RESID(-1)	-0.559824	0.448465	-1.248312	0.2311
RESID(-2)	0.443932	0.340972	1.301962	0.2126

R-squared	0.138214	Meandependent var	-7.78E-16
Adjusted R-squared	-0.493762	S.D. dependent var	0.619328
S.E. of regression	0.756940	Akaike info criterion	2.582038
Sumsquaredresid	8.594381	Schwarz criterion	3.157965
Log likelihood	-22.85751	Hannan-Quinn criter.	2.753291
F-statistic	0.218701	Durbin-Watson stat	1.722333
Prob(F-statistic)	0.992512		

Source: Based on EVIEWS 10 software.

Error variance stability test:The test for invariance of variation test breusch-Pagan-Godfrey indicates the acceptance of the hypothesis of non-existence of invariance of variance and the rejection of the alternative hypothesis where the probability corresponding to this test was equal to 0.92 which is greater than the threshold of significance of 0.05. (This is presented in table 8).

Table 8. Breusch-Pagan-Godfrey Test
Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.389603	Prob. F(9,17)	0.9238
Obs*R-squared	4.616777	Prob. Chi-Square(9)	0.8664
Scaledexplained SS	1.649223	Prob. Chi-Square(9)	0.9959

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/27/2019 Time: 23:26
Sample: 1991 2017
Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.401951	0.568235	0.707367	0.4889
GDPG(-1)	-0.102688	0.157274	-0.652924	0.5225
AGVA	0.009950	0.014528	0.684841	0.5027
AGVA(-1)	0.017627	0.017620	1.000402	0.3311
AGEXP	-1.122906	8.767402	-0.128077	0.8996
AGEXP(-1)	2.288692	7.918637	0.289026	0.7761
AGIMP	0.056433	0.185644	0.303984	0.7648
FEXP	-0.177142	0.448835	-0.394670	0.6980
INDVA	-0.069426	0.067145	-1.033983	0.3156
INDVA(-1)	0.087439	0.130244	0.671347	0.5110

R-squared	0.170992	Mean-dependent var	0.369361

Adjusted R-squared	-0.267895	S.D. dependent var	0.505297
S.E. of regression	0.568969	Akaike info criterion	1.988134
Sumsquaredresid	5.503330	Schwarz criterion	2.468074
Log likelihood	-16.83981	Hannan-Quinn criter.	2.130846
F-statistic	0.389603	Durbin-Watson stat	2.144324
Prob(F-statistic)	0.923809		

Source: Based on EVIEWS 10 software.

Normal distribution test: The Jarque-Bera normal distribution test indicates the acceptance of the hypothesis of nothingness by the nature of the estimated model and the rejection of the alternative hypothesis. where we find that the probability corresponding to this test (0.29) is greater than the limit of significance 0.05. These results are in line with the reality of the Algerian economy. (This is presented in Figure 1).

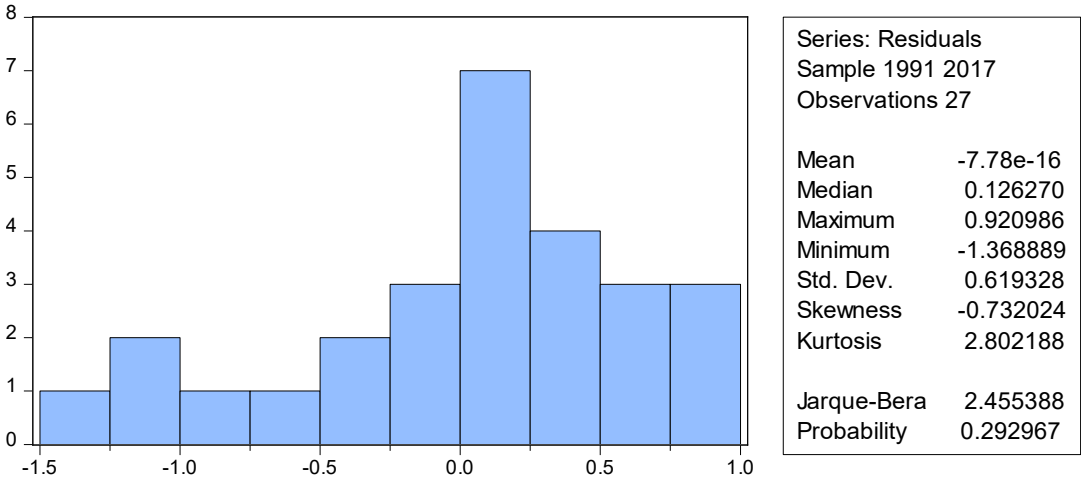

Figure 1. The Jarque-Bera test
Source: Based on EVIEWS 10 software.

The agricultural sector in Algeria is one of the most vulnerable sectors to problems, which can be limited to the following: The weakness of the basic infrastructure to facilitate the delivery of workers necessary for the use of the real estate property in question, reclamation by concession, the lack of clarity of agricultural policy in the long term, the lack of experienced and skilled agricultural labor trained in the use of modern technological methods in production, high investment costs due to the high prices of agricultural production inputs)machines, fertilizers, seeds...), As well as the difficulty of obtaining financing (Dhamadhma, S, & Mimouni, B, 2017, pp. 102-103). Therefore, in order to increase the contribution of the agricultural sector to GDP, the state should work on (Gilan, 2007, pp. 36-37):

- Developing price policies aimed at supporting the prices of agricultural products, especially agricultural products intended for export, as well as those required by the industry,
- Land reclamation with the aim of providing fertile land suitable for agriculture through the establishment of irrigation and irrigation projects and ridding the soil of salinity,
- as well as distributing land to farmers fairly and not fragmenting ownership,
- Develop a strategy for the management of Water Resources, which leads to raising the productivity of agricultural crops,
- Facilitating financing for farmers and providing the necessary loans for this by Islamic banks,

- Training farmers on modern technologies in the agricultural field and the application of agricultural research aimed at reducing agricultural costs, increasing productivity and improving quality.

Conclusion

Through this research related to the study of the Algerian agricultural sector and the role of its contribution to supporting economic growth, we have found the following:
The Phillips-Perron stability test showed that the growth rate of value added of the agricultural sector and the proportion of exports of primary agricultural materials from exports of goods are stable at the level, while the growth rate of GDP and the proportion of imports of primary agricultural materials from imports of goods and the proportion of exports of foodstuffs from exports of goods and the growth rate of value added in the industrial sector were stable in the first differences.

- The presence of a combination of the stability of time series in the level and in the first differences makes there a possibility of a common integration relationship between these time series (long-term relationship) and the boundary method test is considered the most appropriate for this.Which confirmed the existence of a common integration relationship between the study variables.
- The results of estimating the standard model showed a positive correlation between the growth rate of the value added of the agricultural sector and economic growth in the long term.
- The impact of the industrial sector on economic growth in the long term was significant and greater than the impact of the agricultural sector, which indicates the great attention paid by the state to the industrial sector compared to the agricultural sector, as a result of the focus of investment programs on the development of the industrial sector.

However, despite the efforts made by the state to promote the agricultural sector, it remains insufficient and has not achieved the desired results. It is possible that this sector will become an engine of growth and the engine of development in the country if it is given importance, and this is due to the abundance of natural, capital and human resources that Algeria has in this sector, and therefore Algeria should work on:

- To abandon the centralization of economic decision-making, especially in the agricultural field, in order to accelerate the pace of reforms in this sector,
- Establishment of a special body to monitor and follow up the funds allocated to this sector,
- The application of agricultural research by connecting the University with the agricultural environment, working on the formation and training of farmers on modern technologies in the agricultural field as in developed societies such as America and France,
- Directing and increasing peasant support to people and institutions that have proven successful in this field.

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