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Measuring the contribution of the agricultural sector to the GDP in Algeria: a study using the ARDL model

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Abstract

The contribution of the agricultural sector to GDP growth in Algeria over the period 1999–2022, employing the ARDL (Autoregressive Distributed Lag) model as the primary analytical tool has been investigated. The purpose of the study is to assess the short- and long-run dynamics between agricultural output and economic performance. The preliminary analysis showed that the variables used in the study exhibited different levels of stationarity, which required proper lag selection. The bounds testing approach confirmed the existence of a long-term equilibrium relationship, indicating that short-term fluctuations in the agricultural sector can translate into sustained long-term impacts on GDP. The most appropriate model has been found to be ARDL (3,3), reflecting a dynamic and significant interaction between agriculture and economic growth. These findings emphasize the critical role of agriculture as a driver of sustainable development in Algeria. The study suggests that targeted investments and strategic reforms in the agricultural sector could reinforce its role in economic diversification, food security, and long-term stability.

Keyword

Agriculture sector, GDP, ARDL model, degree of delay, ECM, economic diversification, food security

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Измерение вклада сельскохозяйственного сектора в ВВП Алжира: исследование с использованием модели ARDL

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Аннотация

Проанализирован вклад сельскохозяйственного сектора в рост валового внутреннего продукта Алжира за период с 1999 г. по 2022 г. с использованием модели ARDL (авторегрессионной модели с распределенным лагом) в качестве основного аналитического инструмента. Целью настоящего исследования является оценка краткосрочной и долгосрочной динамики между сельскохозяйственным производством и экономической эффективностью. Предварительный анализ показал, что используемые в исследовании переменные обладают различной степенью стационарности, что потребовало корректного выбора лагов. Метод граничного тестирования подтвердил существование долгосрочной равновесной связи между переменными, что свидетельствует о том, что краткосрочные колебания в аграрном секторе могут трансформироваться в устойчивые долгосрочные последствия для валового внутреннего продукта. Наиболее подходящей оказалась модель ARDL (3,3), отражающая динамичное и значительное взаимодействие между сельским хозяйством и экономическим ростом. Полученные результаты подчеркивают важную роль сельского хозяйства как движущей силы устойчивого развития Алжира. Исследование предполагает, что целевые инвестиции и стратегические реформы в аграрной сфере могут усилить его роль в диверсификации экономики, обеспечении продовольственной безопасности и долгосрочной стабильности.

Ключевые слова

Сельскохозяйственный сектор, ВВП, модель ARDL, степень запаздывания, оценка CM, экономическая диверсификация, продовольственная безопасность

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INTRODUCTION

The agricultural sector is a cornerstone of economic and social development, particularly in emerging economies where it provides employment, income, and food security. It plays a vital role in increasing GDP, reducing unemployment, especially in rural and under-industrialized regions, and promoting national self-sufficiency. Additionally, agriculture supplies essential raw materials for agro-industries and contributes to export earnings, thereby supporting overall economic growth and enhancing trade balance [1; 2].

In Algeria, the agricultural sector remains central to national development strategies. It contributes to job creation, especially in rural areas, and helps reduce dependency on food imports by improving domestic agricultural production. The sector also supports economic diversification, reducing reliance on hydrocarbons and contributing to long-term macroeconomic stability.

The study aims to analyze the role of the agricultural sector in promoting GDP growth in Algeria during the period 1999–2022. To achieve this objective, the Autoregressive Distributed Lag (ARDL) model was employed to examine both short- and long-term relationships between agricultural output and economic performance. The findings offer insight into the strategic role of agriculture in driving sustainable growth and enhancing national resilience.

The main issue of the study lies in the question if the agricultural sector, unlike other sectors, contributes to economic growth in Algeria. The premise of it is that the agricultural sector is a real game-changer for Algeria's economy. It drives up GDP by boosting agricultural production, meeting local food needs, and generating exportable surpluses.

PREVIOUS STUDIES

Boubreima's study (2024) aimed to analyze the impact of agricultural foreign trade, represented by agricultural exports and imports, on economic growth in Algeria during the period 1990–2022 [3]. Using the Bounds Testing Approach and the ARDL model, the study found a long-term equilibrium relationship between agricultural exports and real GDP, where the relationship was negative. It reflects the weak contribution of agricultural production to GDP formation. In contrast, agricultural imports showed a positive relationship with real GDP, indicating that agricultural imports serve as inputs for other sectors such as food and processing industries and highlight Algeria's significant agricultural trade deficit.

Ben Aissa's study (2021) examined the role of the agricultural sector in supporting economic growth in Algeria by analyzing the contribution of agricultural value added to GDP [4]. Using the ARDL model, the results revealed a positive relationship between agricultural value added and economic growth. However, this contribution remained relatively low, falling short of the expected outcomes despite the reforms implemented and financial support allocated during periods of high oil revenues.

Bouafia's study (2019) focused on identifying the factors influencing agricultural value added in Algeria using the ARDL model [5]. The findings indicated that several variables significantly impact agricultural value added, highlighting the importance of adopting effective agricultural policies to enhance the sector's contribution to the national economy.

Bouchnefa's study (2020) aimed to measure the impact of the agricultural sector on economic growth in Algeria and compare it with some Arab countries using the ARDL model for

the period 1990–2018 [6]. The results showed a cointegration relationship among the variables in Algeria, Egypt, and Saudi Arabia, indicating a positive long-term effect of the agricultural sector on economic growth in these countries.

ALGERIA'S AGRICULTURAL SECTOR DEVELOPMENT AND ITS CONTRIBUTION TO ECONOMIC GROWTH: POLICIES, OBSTACLES, AND OUTCOMES

Since gaining independence, Algeria's agricultural sector has experienced major shifts, starting with the Self-Management Phase, which involved nationalizing agricultural resources and restructuring abandoned farms into worker-led cooperatives to promote self-sufficiency [7]. However, land distribution remained imbalanced, prompting the introduction of the 1971 Agricultural Revolution Law under the slogan 'Land for those who work it', but its impact was limited due to insufficient government support [8]. Subsequent reforms, such as the Land Reclamation Act (1983) and Law No. 87-19 on Agricultural Investments (1987), provided cultivators with ownership rights and incentives to encourage investment [9][1,2].

The 1990s market transition reclaimed 445 thousand hectares of peasant land and introduced financial support measures, culminating in the National Rural Development Plan, which enhanced technical, financial, and regulatory frameworks for sustainable development [10].

The sector remains vital to economic growth, contributing significantly to GDP, employment, and trade. Its GDP share fluctuated from 11.11% in 1999 to 6.59% in 2008, peaking at 14.13% in 2020 before stabilizing at 11.59% in 2022. Agricultural output expanded from 359 billion dinars in 1999 to 2,869 billion dinars in 2021, with employment distribution reflecting regional disparities: coastal and steppe regions (32.34%), highlands (29.15%), mountainous areas (21.38%), and the South (17.21%) (11). The sector also plays a crucial role in trade, with Algeria targeting USD 4 billion in agricultural exports. Despite pandemic-related challenges, exports surpassed 100 thousand tons in 2020 and 50 thousand tons in early 2021, reinforcing agriculture's role in economic resilience[3].

Economic growth, defined as a country's increasing ability to produce wealth over time, is driven by technological advancements and institutional changes. S. Kuznets describes it as a sustained rise in a nation's capacity to provide diverse goods, while Wajdi links it to improved productivity and per capita income growth [12; 13]. Growth can occur through resource expansion or technological progress [14]. Algeria's economic growth has fluctuated significantly, from 11.20% in 2009 to 22.10% in 2023, largely due to the oil and gas sector's dominance, which exposes the economy to global market volatility[4]. The lack of industrial diversification has further contributed to economic instability, preventing sustainable long-term growth.

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ASSESSING THE IMPACT OF ALGERIA'S AGRICULTURAL SECTOR ON ECONOMIC GROWTH USING THE ARDL MODEL (1999-2022)

The present study investigates the impact of the agricultural sector on Algeria's economic growth (1999–2022) by employing the ARDL model. The primary objective is to ascertain the extent to which the agricultural sector has contributed to the country's GDP (Table 1 and Fig. 1).

Table 1

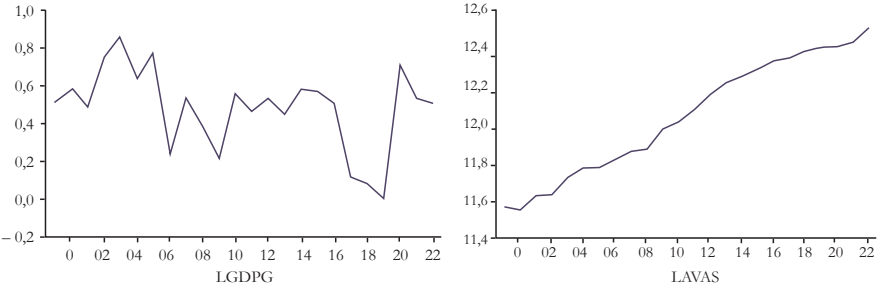
Highlights of Algeria's agricultural value-added and economic growth trends (1999–2022)

Year	1999, 10^6 / Da, %	2000, 10^6 / Da, %	2001, 10^6 / Da, %	2002, 10^6 / Da, %	2003, 10^6 / Da, %	2004, 10^6 / Da, %
GDPDG	3.2	3.8	3.0	5.6	7.2	4.3
The added value of the agriculture sector	359,666.0	346,171.0	412 119.0	417,225.0	515,282.0	580,506.0
Year	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
GDPDG	5.9	1.7	3.4	2.4	1.6	3.6
The added value of the agriculture sector	581,616.0	641,285.0	708,072.0	727,413.0	931,349.0	1,015,259.0
Year	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
GDPDG	2.9	3.4	2.8	3.8	3.7	3.2
The added value of the agriculture sector	1,183,216.0	1,421,693.0	1,640,006.0	1,772,202.0	1,935,113.0	2,140,305.0
Year	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
GDPDG	1.3	1.2	1.0	– 5.1	3.4	3.2
The added value of the agriculture sector	2,219,100.0	2,421,600.0	2,529,100.0	2,546,900.0	2,688,300.0	3,207,800.0

Compiled by the authors on the materials of the source[5]

First, the study variables are defined:

– agricultural value added (measured in fixed local currency) represents the agricultural sector;
– GDP growth reflects overall economic expansion;
– to standardize the units, the decimal logarithm is applied.



Compiled by the authors on the materials of the study

Fig. 1. A curve of the GDP growth series and the added value of the agriculture sector

[5] The World Bank in Algeria. Access mode: https://www.worldbank.org/en/country/algeria/overview#:~:text='The%20main%20challenge%20for%20the,revenues%20between%202019%20and%202023 (accessed 10.05.2025).

The key variables include:

– LGDPG (local Government Development Planning Guideline): the logarithm indicates the growth of GDP;

– LAVAS: the logarithm reflects the added value of the agricultural sector.

This model can be represented as ARDL(ρ, q_1, q^2, …), where (ρ) is the lag period of the dependent variable, and (q_1, q^2, …) are the lag periods of the independent variables.

The ARDL model is formulated as follows:

$$GDPG_t = \alpha + \sum_{t=1}^{\rho} \gamma_t GDPG_{t-1} + \sum_{j=1}^{k} \sum_{i=0}^{q} \beta_{ij} AVAS_{J,t-i} + \varepsilon_t \ . \quad (1)$$

Distributed lag self-regression model is formulated as follows:

$$LGDPG_t = \alpha + \sum_{t=1}^{\rho} \gamma_t LGDPG_{t-1} + \sum_{j=1}^{k} \sum_{i=0}^{q} \beta_{ij} LAVAS_{J,t-i} + \varepsilon_t \ . \quad (2)$$

Before we do the unit root test, it's really important to work out the best lag periods using the minimum criteria values:

– Akaike Criterion (AIC):

$$AIC(P) = Ln\left|\sum_e\right| + \frac{2k^2 p}{n} \ ; \quad (3)$$

– Schwartz Criterion (SC):

$$SC(P) = Ln\left|\sum_e\right| + \frac{k^2 p.Ln(n)}{n} \ . \quad (4)$$

The results obtained are summarized in the Table 2.

Table 2

Time dilation determination

Number of slowdowns	**0**	**1**	**2**	**Optima deceleration period**
LGDPG	Akaike	– 0.181216	– 0.146376	– 0.048822
	Schwartz	– 0.131508	– 0.046961	0.100300
LAVAS	Akaike	0.130063	– 4.204964	– 4.100584
	Schwartz	0.179771	– 4.105549	– 3.951462
Number of slowdowns	**3**	**4**	**5**	**Optima deceleration period**
LGDPG	Akaike	– 0.040632	0.035778	0.086911
	Schwartz	0.158197	0.284314	0.385155
LAVAS	Akaike	– 4.001816	– 4.006683	– 3.936605
	Schwarz	– 3.802987	– 3.758146	– 3.638361

Compiled by the authors on the materials of the study

Optimal lag degrees are zero for GDP growth and renewable energy, and first-degree for agricultural value-added.

The study utilizes the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, along with several other methodologies.

Premise: H_0:$Ø_1 = 1$, H_1:$Ø_1 < 1$.

If it is $t_{tab} < t_{Øi}$, we do not reject the null hypothesis.

If it is $t_{tab} > t_{Øi}$, the null hypothesis is rejected in favor of the alternative hypothesis.

The results obtained are summarized in the Table 3.

Table 3

Stability test of ADF and PP (5% of significance level)

Variants	ADF			
	Variable	**Constant**	**Constant and time**	**Without constant and time**
LGDPG	Calculated	– 3.258330	– 3.788997	– 1.960656
	Critical	– 2.998064	– 3.658446	– 1.956406
LAVAS	Calculated	– 0.327354	– 2.013597	6.210202
	Critical	– 2.998064	– 3.658446	– 1.956406
Variants	**PP**			
	Variable	**The constant**	**Constant and time**	**(Without constant and time)**
LGDPG	Calculated	– 3.240506	– 3.788997	– 1.660656
	Critical	– 2.998064	– 3.658446	– 1.956406
LAVAS	Calculated	– 0.327354	– 2.008242	6.953733
	Critical	– 2.998064	– 3.658446	– 1.956406

Compiled by the authors on the materials of the study

Table 4 shows a comparison of a stability test between LGDPG and LAVAS. The LGDPG series is steady at level I(0), as its ADF test value is higher than the critical value. However, the LAVAS series shows lower calculated values in both ADF and PP tests, which indicates a trend and non-stationarity at the origin where:

– LGDPG refers to Log of GDP Growth, meaning the logarithm of GDP Growth rate;

– LAVAS may refer to Log of Agricultural Value Added Share, meaning the logarithm of the agricultural value-added share.

Removing the instability of the original LAVAS chain can be made through stationary differencing:

$$D(LAVAS) = LLAVAS_t - LAVAS_{t-1}. \quad (5)$$

It is possible to obtain the first-order difference series.

Table 4

Stability test for ADF and PP (5% of significance level)

Variant	ADF			
	Variable	**Constant**	**Constant and time**	**Without constant and time**
LAVAS	Calculated	– 6.762493	– 6.605440	– 6.929302
	Critical	– 3.004861	– 3.632896	– 1.957204
	PP			
	Variable	**Constant**	**Constant and time**	**Without constant and time**
	Calculated	– 6.898677	– 6.746821	– 7.074163
	Critical	– 3.004861	– 3.632896	– 1.957204

Compiled by the authors on the materials of the study

We shall assess the steadiness of the residuals series (Resid) of the first difference (Table 5).

Table 5

Steadiness test of the residuals series of the first difference

Variants	ADF			
	Variable	Constant	Constant and time	Without constant and time
LGDPG	Calculated	– 3.258330	– 3.588997	– 1.160656
	Critical	– 2.998064	– 3.622033	– 1.956406
LAVAS	Calculated	– 0.327354	– 2.013597	6.210202
	Critical	– 2.998064	– 3.658446	– 1.956406
Variants	**PP**			
	Variable	**Constant**	**Constant and time**	**Without constant and time**
LGDPG	Calculated	– 3.240506	– 3.788997	– 1.660656
	Critical	– 2.998064	– 3.658446	– 1.956406
LAVAS	Calculated	– 0.327354	– 2.008242	6.953733
	Critical	– 2.998064	– 3.658446	– 1.956406

Compiled by the authors on the materials of the study

Table 5 shows that the residue series for LGDPG is stable at I(0), with calculated ADF and PP values (– 3.258330 and – 3.240506) greater than the critical value (– 2.998064). For the LAVAS series, the Resid series is stable at I(0), as the calculated ADF and PP values (6.210202 and 6.953733) exceed the critical value (– 1.956406). The results show that LGDPG and LAVAS have a short-term equilibrium relationship and behave similarly in the short term.

We shall run a boundary test for co-integration. If the computed value surpasses the upper critical threshold in the bounds testing approach, the null hypothesis is dismissed in favor of the alternative, confirming a long-term equilibrium link among the examined variables.

1. Modified common integration boundary test.

$$\Delta GDPG_t = \alpha + \sum_{i=1}^{p-1} \gamma_i \Delta LGDPG_{t-i} + \sum_{j=1}^{k} \sum_{i=0}^{q-1} \beta_{ij} \Delta LAVAS_{j,t-i} + \rho LGDPG_{t-1} + \sum_{j=1}^{k} \delta_j LAVAS_{j,t-1} + \varepsilon_t. \quad (6)$$

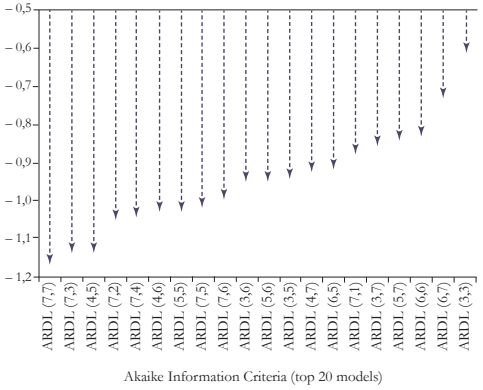
Test hypothesis:

$$\begin{cases} H_0 : \rho = \delta_j = 0 \\ H_1 : \rho \neq \delta_j \neq 0 \cdot \end{cases} \quad (7)$$

The results of the modified boundary test for cointegration showed that the calculated F value was 4.439697, compared to the critical values at the 1, 5, and 10% significance levels for both the lower bound I(0) and the upper bound I(1). The critical values for the lower bound were 4.94, 3.62, and 3.02, while those for the upper bound were 5.58, 4.16, and 3.51, respectively. The calculated F value falls between the lower and upper critical bounds at the 5 and 10% significance levels, indicating the existence of a long-term cointegration relationship between the variables under study. It suggests a stable equilibrium relationship between GDP growth and agricultural value-added.

2. Long-term relationship estimation: cointegration regression model.

We shall study the long-term equilibrium framework (Fig. 2).



Compiled by the authors on the materials of the study

Fig. 2. Long-term equilibrium framework

We chose the ARDL model (3.3) for long-term equilibrium estimation because it had the lowest AIC value.

We shall estimate the model:

$$LGDPG = 0.210781829687 \cdot LGDPG(-1) - 0.223450165525 \cdot LAVAS + 3.07142521112, \quad (8)$$

where *LGDPG* is affected by its own previous year's lag and the *LAVAS*.

A 1% increase in lagged LGDPG leads to a 0.21% increase in GDP growth for the current year, assuming other variables are constant.

There is an inverse relationship between the current year's agricultural value-added logarithm and GDP growth logarithm. There is a direct relationship between the lagged GDP growth logarithm and the current year's GDP growth logarithm.

We need to estimate the error correction model to analyze the adjustment speed coefficient, which confirms the common integration relationship between the variables if it meets specific criteria:

$$\Delta GDPG_t = \alpha + \sum_{i=1}^{p-1} \gamma_i \Delta LGDPG_{t-i} + \sum_{j=1}^{k} \sum_{i=0}^{q-1} \beta_{ij} \Delta LAVAS_{J,t-i} - \varphi ECT_{t-1} + \varepsilon_t, \quad (9)$$

where $\varphi\ ECTt_{-1}$ refers to the variable the random errors (residuals) generated when estimating the relationship in the long run are time-lagged by one period of slowdown and means φ (the modulation speed coefficient).

Alongside the outcomes of this model, the data is presented in the Table 6.

Table 6

Error correction results

Variable	Coefficient	Standard Error	t-Statistics	Probability (Prob)
D(LGDPG(– 1))	0.737703	0.275980	2.673032	0.0192
D(LGDPG(– 2))	0.908427	0.254622	3.567755	0.0034
D(LAVAS)	– 4.116598	1.408394	– 2.922901	0.0119

End of Table 6

Variable	Coefficient	Standard Error	t-Statistics	Probability (Prob)
D(LAVAS(– 1))	1.443495	1.021078	1.413697	0.1809
D(LAVAS(– 2))	2.652633	1.308015	2.027983	0.0636
CointEq(– 1)	– 1.571915	0.328351	– 4.787299	0.0004
ARDL Error Correct Regression				
Dependent Variable: D(LGDPG)				
Selected Model: ARDL(3.3)				
Sample: 1999–2022				
Included observations: 21				
ECM Regression				

Compiled by the authors on the materials of the study

The error correction model shows that all the variables are significant at the 5% level. The error correction coefficient (CointEq(– 1)) is negative and significant (Prob = 0.0004), suggesting a long-term equilibrium relationship. A coefficient value of – 1.57 shows a quick adjustment speed, correcting 157% of short-term deviations from equilibrium in each period.

STUDY RESULTS ANALYSIS

The study results indicate that the optimal lag degrees for the logarithm series of GDP growth (LGDPG) and renewable energy capacity are zero, while the optimal lag for the logarithm of agricultural sector value-added (LAVAS) is one. This finding aligns with Ben Aissa (2021), who emphasized that the contribution of agricultural value-added to Algeria's economic growth exists but remains lower than expected [4]. It underscores the need for supportive policies to enhance the agricultural sector's role in the national economy.

Regarding stationarity, the findings indicate that the LGDPG series exhibits instability at I(0) due to the presence of unit roots, whereas the LAVAS series remains stable at I(0), aligning with Bouafia (2019), who identified several determinants influencing agricultural value-added in Algeria, highlighting the necessity for effective agricultural strategies to ensure the sector's stability and long-term performance [5].

Moreover, the findings confirm the existence of long-term cointegration between GDP growth and agricultural sector value-added at the 5 and 10% significance levels. This result is in line with Bouchnefa (2020), who found that there is a long-term relationship between the agricultural sector and economic growth in Algeria, Egypt, and Saudi Arabia, indicating that agriculture plays a role in economic development, albeit at varying degrees across different countries [6].

Additionally, the error correction coefficient CointEq(– 1) is negative and statistically significant (Prob = 0.0004), confirming a long-run equilibrium relationship, with a coefficient of – 1.57 indicating an adjustment speed of 157% toward equilibrium per period. This finding aligns with Boubreima (2024), who observed that agricultural exports had an inverse relationship with economic growth, while agricultural imports had a positive relationship with real GDP [3]. It suggests that Algeria's reliance on agricultural imports as inputs for food and manufacturing industries could impact the equilibrium performance of the agricultural sector in the national economy.

Overall, these results confirm that Algeria's agricultural sector contributes to economic growth but still faces challenges that affect the sustainability of its contribution. It underscores

the importance of increasing investment in the sector, supporting local production, and reducing reliance on agricultural imports to ensure a more stable and significant contribution to economic development.

HYPOTHESIS TESTING

The study results indicate that the agricultural sector plays a key role in supporting economic growth in Algeria, contributing to GDP expansion by enhancing agricultural production, meeting local demand, and generating exportable surpluses. The findings also confirm a strong integration between the agricultural and economic sectors in both the short and long term, highlighting agriculture's significance as a strategic sector for achieving sustainable development.

RECOMMENDATIONS

Based on ARDL model results for the period between 1999 and 2022, which revealed a long-term equilibrium relationship between the studied variables (such as government agricultural expenditure, product prices, and production changes), the following recommendations are proposed in a detailed manner that reflects their practical nature and relevance to public policy:

1) strengthening agricultural infrastructure:

– government investments should be directed toward expanding and modernizing irrigation networks, particularly in provinces heavily dependent on rainfall (e.g., Adrar and Biskra), through programs implemented by the Ministry of Agriculture in coordination with the Ministry of Water Resources;

– improving rural transportation networks by paving roads leading to agricultural production zones and establishing a dedicated infrastructure fund within the annual Finance Law;

– creating storage centers for perishable agricultural products in line with modern refrigeration standards, while offering land and tax incentives for private investors in this field;

2) providing targeted financial support to farmers:

– launching a subsidized financing mechanism through the Agricultural and Rural Development Bank (BADR), offering loans with interest rates not exceeding 1% per year for small and medium-scale farmers, especially in the southern and high plateau provinces;

– allocating interest-free loans to farmers operating in regions exposed to extreme climate events (such as droughts or floods), provided they commit to sustainable production plans;

– establishing a multi-risk agricultural insurance system overseen by the National Fund for Agricultural Cooperation (CNMA), which includes:

- financial compensation for farmers affected by natural disasters;
- partial insurance coverage against major market fluctuations or price collapses;
- participatory programs involving contributions from the state, farmers, and financial institutions to share risk;

3) expanding agricultural research and technology transfer:

– the model results indicate the importance of technology as a long-term factor in boosting agricultural output – increasing funding for national agricultural research centers, especially the National Institute of Plant Protection and the Technical Institute for Field Crops (ITGC), to develop climate-resilient local varieties;

– introducing practical training programs for farmers on precision agriculture, smart irrigation systems, and resilient crops, supervised by local agricultural departments;

– creating digital platforms that link researchers with farmers to accelerate the transfer of research findings to practical applications;

4) establishing strong public-private partnerships:

– encouraging private investment in the agricultural sector through five-year tax exemptions for projects related to agri-food processing or cold chain development;

– simplifying administrative procedures via the creation of a one-stop shop for agricultural investors within the National Investment Development Agency (ANDI);

– promoting joint ventures between the government and the private sector to develop agricultural industrial zones (ZAIC), particularly in the Southern regions;

5) revising legal and regulatory frameworks:

– establishing a national multi-sectoral committee (agriculture, interior, investment) tasked with reviewing and updating the Agricultural Orientation Law No. 08-16;

– prioritizing the revision of:

- laws related to the ownership and use of agricultural land (e.g., the Concession Law);
- regulations governing domestic marketing and protecting producers from speculation;
- involving farmer representatives and agricultural chambers in drafting legal proposals to ensure alignment with real agricultural practices;

6) developing agricultural product marketing systems:

– supporting the creation of local and regional cooperatives for production and marketing, tasked with aggregating output and engaging in collective negotiations with buyers;

– organizing training sessions in agricultural marketing and export strategies for young farmers, in coordination with the Ministry of Trade and Chambers of Commerce;

– implementing mechanisms to support the export of agricultural products with comparative advantages (such as dates and potatoes), including partial subsidies for logistics and compliance with European standards (e.g., Global GAP);

7) promoting environmental sustainability in agricultural activity:

– adopting a national plan to combat desertification and land degradation, including afforestation projects in ecological buffer zones in provinces such as Djelfa and El Oued;

– regulating the use of underground water resources through a flexible licensing system that links extraction quantities to farm performance;

– offering incentives to farmers who adopt organic farming or comply with standards for soil and water protection, including preferential permits for financial support access.

CONCLUSION

The study underscores the pivotal role of the agricultural sector in Algeria's economy and its significant contribution to sustainable development. The findings confirm its positive impact on GDP in both the short and long term, highlighting the necessity of strategic investments to maximize its potential. The sector remains a key driver of food security, job creation and rural development highlight the need for improving agricultural infrastructure, offering financial assistance to farmers, and adopting modern technologies to enhance productivity and strengthen economic resilience.

Despite its potential, Algeria's agricultural sector faces persistent challenges related to funding, infrastructure, and innovation. Addressing these challenges necessitates greater investment in agricultural research, strengthening public-private partnerships, and enhancing government support to achieve long-term sustainability.

With its considerable potential, the agricultural sector can serve as a cornerstone for economic diversification and growth in Algeria. Implementing sustainable and integrated strategies is crucial for strengthening food security, promoting social stability, and enhancing Algeria's economic standing both regionally and globally.

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