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Assessing the Impact of Supply Chain Resilience on National Food Security: Evidence from Global Agri-Food and Kotama Agri-Food in Algeria

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Abstract:
This study evaluates how supply chain resilience contributes to national food security in Algeria, based on evidence from Global Agri-Food and Kotama Agri-Food. Using SPSS-supported analysis, the findings show a strong positive link between resilience practices—such as adaptability, responsiveness, and information sharing—and the stability of food supply. The results underline the importance of robust logistics and rapid recovery capabilities in strengthening Algeria's food system in an uncertain global context.

Keywords: Supply Chain Resilience; National Food Security; Agility; Visibility; Velocity; Algeria; Global Agri-Food; Kotama Agri-Food.
Jel Classification Codes: Q18, Q02, M11, L66, O13.

1. INTRODUCTION :

National food security has become a major development challenge of the twenty-first century, especially for countries exposed to economic, environmental, and geopolitical shocks. Algeria, like many food-import-dependent nations, faces structural vulnerabilities that affect the stability of food availability, access, and distribution. In this context, the performance of agri-food supply chains plays a crucial role in ensuring a steady flow of essential products. Supply chain resilience—the ability to anticipate, absorb, adapt to, and recover from disruptions—has therefore become central to protecting national food systems.

The rise of global disruptions such as pandemics, climate variability, trade restrictions, and logistics bottlenecks has highlighted the need for supply chains capable of maintaining operations under stress. Agri-food firms are especially important, as their procurement, transport, and distribution activities directly

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influence food availability and price stability. In Algeria, Global Agri-Food and Kotama Agri-Food are key actors in the national supply network, making the resilience of their operations a critical factor in safeguarding food security.

1. 1. General problematic: Algeria's national food security faces persistent pressures from rising demand, climate variability, price instability, and dependence on food imports. In this context, resilient agri-food supply chains are essential for ensuring stable availability and distribution of key products. This study is guided by the central question:

«How does supply chain resilience within leading agri-food companies contribute to strengthening national food security in Algeria?»

Based on this problem, the study seeks to answer the following research questions:

1. 1. 1- To what extent do the resilience capabilities of Global Agri-Food and Kotama Agri-Food contribute to strengthening national food security in Algeria?

1 .1. 2-What are the main supply chain risks faced by these agri-food companies, and how effectively are these risks mitigated through resilience strategies?

1. 1. 3- Which dimensions of supply chain resilience—such as adaptability, responsiveness, visibility, and velocity—exert the strongest influence on food availability, supply continuity, and price stability?

1- 1. 4- How can reinforcing supply chain resilience within Global Agri-Food and Kotama Agri-Food enhance long-term national food security in Algeria?

1. 2- Hypotheses of the Study: Based on the research problem and objectives, the study formulates the following hypotheses:

- **H1:** Supply chain resilience has a statistically significant positive impact on national food security in the Algerian agri-food sector.
- **H2:** Higher levels of supply chain adaptability and responsiveness significantly enhance the stability and continuity of food supply in Global Agri-Food and Kotama Agri-Food.
- **H3:** Effective risk management and redundancy within supply chain operations reduce disruption-related vulnerabilities and contribute positively to national food security.
- **H4:** Improved supply chain visibility and logistical efficiency strengthen food availability and ensure the continuous flow of essential products, thereby enhancing national food security.

1. 3- Objectives of the Study : This research aims to achieve the following objectives:

- To analyze the role of supply chain resilience in supporting national food security in Algeria.
- To assess the resilience capacity of Global Agri-Food and Kotama Agri-Food across key dimensions such as adaptability, responsiveness, visibility, and risk management.
- To identify the main vulnerabilities affecting agri-food supply chains and evaluate their impact on food supply stability.
- To develop recommendations for strengthening supply chain resilience as a strategic pathway to enhance national food security.

1. 4- Importance of the Study : This study is important because it examines how resilient agri-food supply chains help strengthen national food security in Algeria, a country increasingly exposed to global market volatility and supply disruptions. By analyzing Global Agri-Food and Kotama Agri-Food, the research provides evidence on how firm-level resilience practices—such as adaptability, responsiveness, and risk management—support the continuous availability and distribution of essential food products. The findings offer valuable insights for policymakers seeking to reduce import dependence and improve the stability of the food system, as well as for companies aiming to enhance their preparedness and operational continuity. Overall, the study highlights that resilient supply chains are essential not only for business performance but also for safeguarding national food security.

2.Review of the Literature: Understanding the connection between supply chain resilience, performance, and national food security requires a solid theoretical base. This section reviews core concepts and previous studies, showing how resilient supply chains maintain performance during disruptions and support food security.

2.1-Definition of Supply Chain Resilience (SCR)

The concept of supply chain resilience has gained growing attention as global disruptions increasingly challenge the continuity of supply chain operations. According , The academic literature on supply chain management defines resilience According to **Christopher and Peck (2004)** as “the ability of a system to return to its original state or move to a new, more desirable state after being disturbed. (Mulopulos 2025, 21) ”, Originally, **Ponomarov and Holcomb (2009)** define supply chain

resilience as : « the adaptive capability of the supply chain to prepare for unexpected events, respond to disruptions, and recover by maintaining continuity of operations. (Jian Zuo, 2024, p. 157*)* ».To be more specific, Ponomarov and Holcomb (2009) defined supply chain resilience as "the adaptive capability of the supply chain to prepare for unexpected events, respond to disruptions, and recover from them by maintaining continuity of operations at the desired level of connectedness and control over structure and function. (Dale S. Rogers, The Oxford Handbook of Supply Chain Management, 2022, p. 343)". Resilience ensures that the supply chain can recover quickly and cost-effectively from disruptions caused by natural disasters (such as earthquakes), social factors (employee strikes), medical emergencies (epidemics such as H1N1 flu), economic setbacks (the bankruptcy of a critical link in the chain) or technological failures (a software crisis)" (George A. Zsidisin 2018, 75).

2. 2- Components of Supply Chain Resilience :

2.2.1 -Supply Chain Agility: Supply chain agility is the ability of a firm to quickly sense and respond to internal and external uncertainties. It relies on strategic capabilities for detecting environmental changes and operational abilities for rapid process adjustment. Gligor et al. (2013) identify five dimensions of agility: alertness, accessibility, decisiveness, swiftness, and flexibility. Flexibility and strong information systems significantly enhance agility. Overall, an agile supply chain can react rapidly and effectively to disruptions, market changes, and new opportunities **.**(Sengun Yeniyurt 2024, 12-13)

2.2.2 -Supply Chain Visibility : Supply chain visibility is the organization's ability to track demand, supply, inventory, and production activities across all network stages. It requires eliminating information silos and ensuring continuous data exchange between partners, where firms share accurate demand signals and suppliers provide reliable capacity information. Strong visibility supports better inventory decisions and enables early detection of disruptions, which strengthens resilience. However, visibility becomes challenging in multi-tier supply chains where complexity and fragmentation create uncertainty. Overall, high visibility improves decision-making and reduces vulnerability to supply chain shocks. (Manners-Bell 2023, 35-36).

2.2.3- Supply Chain Velocity : Supply chain velocity refers to the speed at which a supply chain detects, reacts to, and recovers from disruptions or market changes. It focuses on rapid response and efficient operational adjustment, with lead time serving as a key indicator. Velocity is reflected in four dimensions: the speed of disruption onset, the rate at which losses escalate, the time required to detect the disruption, and the speed of recovery. High supply chain velocity enhances resilience by reducing the impact of disruptions and enabling faster restoration of operations (Dale S. Rogers, Op Cit, p. 344).Supply chain velocity also reflects how quickly a supply chain reacts to shifts in demand or market conditions. It relies heavily on timely information-sharing among partners, enabling rapid operational adjustments. Higher velocity strengthens resilience by allowing firms to respond faster, limit delays, and maintain continuity of supply. (Francesca Faggioni 2025, 39).

2. 3- National Food Security concept: According to the Food and Agriculture Organization (FAO, 2021), national food security exists when all individuals have reliable access to sufficient, safe, and nutritious food that meets their dietary needs for an active and healthy life. FAO emphasizes that food security is built on four interdependent dimensions: **availability**, **access**, **utilization**, and **stability**, which together determine the resilience of national food systems. The 2021 report stresses that economic shocks, climatic events, and supply chain disruptions continue to threaten these pillars, especially in developing regions, making robust and adaptive food systems essential for long-term national stability (FAO, The State of Food Security and Nutrition in the World 2021: Transforming food systems for food security, improved nutrition and affordable healthy diets for all 2021, 05-07). National food security refers to a country's ability to ensure that all people consistently access sufficient, safe, and nutritious food, even during shocks such as pandemics or economic disruptions. Adigbonon, Bloem, and Sanoh (2020) emphasize that food security is multidimensional, involving food availability, household purchasing power, and the stability of supply systems during crises. They explain that disruptions like COVID-19 highlight the fragility of national food supply chains, showing that food security cannot rely solely on production but must also depend on resilient distribution networks and functioning markets that allow populations to access food reliably (Guigonan Serge Adjognon, The Coronavirus Pandemic and Food Security November 2020, 03-04).

2.4- Determinants of National Food Security: National food security is shaped by a combination of structural, economic, environmental, and institutional factors that determine a country's ability to ensure stable access to sufficient, safe, and nutritious food. The most influential determinants commonly identified in the literature include :

2.4-1- domestic agricultural production capacity:

Domestic agricultural production capacity is a core determinant of national food security because it directly affects the volume, stability, and diversity of food available within a country. The FAO (2021) explains that countries with productive agricultural sectors are better positioned to meet domestic demand, limit exposure to global price volatility, and maintain stable supplies during crises. Production capacity depends on land quality, water resources, technology, infrastructure, and farmers' technical skills (FAO, Op Cit s.d., 12-15). The World Bank (2020) emphasizes that investments in improved seeds, mechanization, storage, and sustainable land management significantly enhance yields and reduce post-harvest losses. Research also shows that limited domestic production increases reliance on imports and heightens vulnerability to market disruptions (Guigonan Serge Adjognon, Op Cit s.d., 04-06). Strengthening agricultural capacity is therefore essential for ensuring food availability, supporting rural livelihoods, and reinforcing long-term national resilience (Fan, Reflections on the Global Food Crisis: How Did It Happen? How Has It Hurt? And How Can We Prevent the Next One? 2010, 20–23).

2.4-2- Food Import Dependence : Food import dependence is a critical determinant of national food security, particularly for countries that cannot fully meet domestic demand through local production. According to the FAO (2020), relying heavily on imported food exposes national food systems to external risks such as global price volatility, fluctuations in exchange rates, and disruptions in international trade flows (Organization, The State of Agricultural Commodity Markets 2020: Agricultural markets and sustainable development: Global value chains, smallholders and digital innovations 2020, 18–20) . When international markets experience instability, import-dependent countries face higher uncertainty regarding both food availability and affordability. The World Bank (2022) similarly notes that shocks such as geopolitical conflicts, pandemics, and supply chain bottlenecks can sharply limit import capacity and cause rapid increases in domestic food prices (Bank, Rising Global Food Insecurity: Assessing Policy Responses A report prepared at the request of the Group

of 20 (G20) April 2023, 9–11). Headey and Fan (2010) emphasize that dependency on imports intensifies vulnerability, especially when countries lack diversified suppliers or sufficient foreign currency (Fan, Op Cit s.d., 25–27). For these reasons, high import dependence is considered a structural weakness in national food security, making countries more susceptible

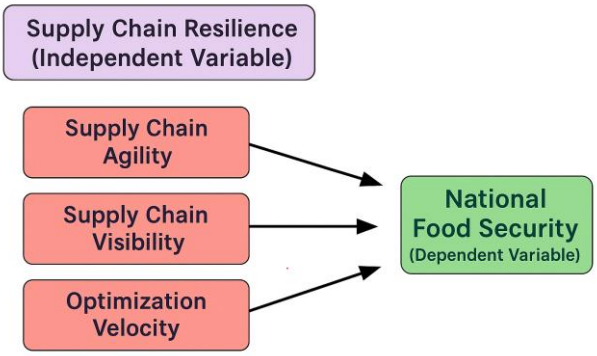
2.4-3- Infrastructure and Logistics Efficiency : Infrastructure and logistics efficiency are key determinants of national food security because they shape how quickly and safely food moves from producers to consumers. Strong transport systems, reliable storage facilities, and effective cold chains help reduce food losses and ensure continuous market supply. According to the World Bank (Bank, World Development Report 2020: Trading for Development in the Age of Global Value Chains s.d., 41–43), countries with weak logistics face higher waste levels and greater supply instability. FAO (2019) adds that modern roads, ports, and warehouses improve food flow and reduce delays, especially for perishable goods (Organization, The State of Food and Agriculture 2019: Moving Forward on Food Loss and Waste Reduction 2019, 27–29). Many studies show that efficient logistics systems also lower distribution costs and increase resilience during shocks such as pandemics or climate events (Arvis 2018, 12–14). Overall, strong infrastructure and logistics capacity are essential for a stable and resilient national food system.

3– Methodology: This study uses a descriptive and analytical field-based approach to assess how supply chain resilience affects national food security in Algeria. The research focuses on Global Agri-Food and Kotama Agri-Food, two key actors in the national food supply. Data were collected through structured questionnaires targeting employees involved in logistics, procurement, production, and distribution. Statistical analysis was then used to measure the relationship between supply chain resilience practices and national food security outcomes. This approach provides empirical evidence on how strengthening supply chain operations can support food system stability in Algeria.

3– 1-Thinking Framework: The thinking framework of this study links **supply chain resilience (Independent Variable)** with **national food security (Dependent Variable)** within the context of Global Agri-Food and Kotama Agri-Food in Algeria. The framework assumes that key dimensions of supply chain resilience—such as agility, visibility,

Velocity —collectively influence a country's ability to ensure stable access to food. Through this conceptual structure, the study aims to analyze how strengthening resilience across different stages of the supply chain supports national food security by improving availability, access, stability, and reliability of food supplies.

Figure 1. Framework of thinking



Source: Prepared by researchers based on theoretical and empirical aspects.

3–2-Methods and Materials : This study adopts a quantitative approach using a structured questionnaire to measure supply chain resilience and its impact on national food security in Global Agri-Food and Kotama Agri-Food. The instrument includes three sections: general respondent information, indicators of supply chain resilience (agility, visibility, and velocity), and measures of national food security. This structure ensures that the data collected aligns directly with the study's objectives and supports hypothesis testing.

3. 4-Research Design: This study adopts a **quantitative research design**, relying on a structured questionnaire to gather data from employees working within Global Agri-Food and Kotama Agri-Food's supply chain operations. The quantitative approach enables objective measurement of the variables and supports statistical analysis of the relationship between **supply chain resilience (independent variable)** and **national food security (dependent variable)**. This design ensures reliability, comparability, and accuracy in evaluating how resilience practices contribute to strengthening Algeria's food security.

3. 5- Data collection and the validity and reliability tool: Data for this study were collected through a structured questionnaire distributed to

employees of Global Agri-Food and Kotama Agri-Food across various supply chain functions. Participants included directors, managers, engineers, supervisors, technicians, and operators from key departments such as procurement, logistics, production, and finance. The questionnaire was designed to capture all variables of interest and was structured using a five-point Likert scale ranging from **Strongly Disagree (1)** to **Strongly Agree (5)**. To ensure the credibility of the instrument, the questionnaire items were reviewed for content validity, and their internal consistency was assessed using reliability tests, confirming that the tool was suitable for measuring the study's constructs.

Table 1. Reliability and Validity Analysis

Section	Number of Items	Cronbach's Alpha (Stability Coefficient)	Questionnaire Validity Coefficient
Section 1: Independent Variable – Supply Chain Resilience	7	0.933	0.965
Section 2: Dependent Variable – National Food Security Contribution	6	0.957	0.978
Overall Reliability of the Questionnaire (All Items)	13	0.972	0.985

Source: *Prepared by the researchers based on the results obtained.*

Cronbach's Alpha coefficients exceeded 0.90 across all sections of the questionnaire, demonstrating excellent internal consistency and confirming that the instrument reliably captures the underlying constructs. The validity coefficients, all above 0.96, further indicate that the questionnaire accurately measures the intended variables without ambiguity. With an overall reliability score of 0.972, the instrument is considered highly robust and dependable, making it suitable for analyzing the relationship between supply chain resilience and national food security in Global Agri-Food and Kotama Agri-Food.

3 .6-Methods of data collection: Methods of data collection relied on two main sources of information:

1. **Primary sources** – Data obtained through field research, including responses collected via questionnaires.
2. **Secondary sources** – Data gathered from existing literature, such as books, scientific articles, reports, and accounting research.

3.6- Research Population and Sampling Methodology: The study targeted employees from Global Agri-Food and Kotama Agri-Food who are directly

involved in supply chain activities such as procurement, logistics, warehousing, production, quality control, and planning. These groups are essential for assessing how supply chain resilience supports national food security. A stratified random sampling method ensured balanced representation across companies, departments, and job levels. Out of 220 distributed questionnaires, 204 were returned, and after screening, 198 valid responses were retained, producing a strong response rate of 90 percent. This sample size provides sufficient statistical power for the quantitative analysis conducted using SPSS

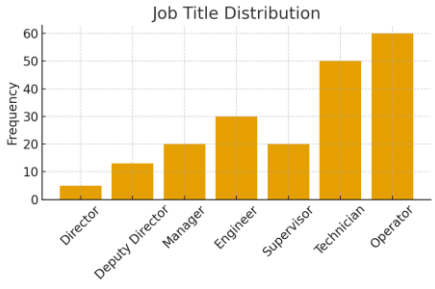
3 .7-Data Analysis: The collected data will be analyzed using SPSS (Statistical Package for the Social Sciences), version 22. Descriptive statistics, including means and frequency distributions, will be applied to summarize respondents' perceptions and demographic characteristics. Inferential statistical techniques, such as correlation and regression analyses, will be used to examine the relationship between supply chain resilience and national food security. In particular, the study relies on arithmetic means, standard deviations, simple linear regression, and multiple regression analyses to test the formulated hypotheses and determine the strength, direction, and significance of the associations between the variables.

4.Results and discussion : This section presents the findings of the study, followed by an in-depth discussion of their implications.

4. 1-Demographic Analysis and Characteristics of the Sample : This section provides a brief overview of the demographic profile of the 198 respondents.

4. 1-1-Job Title Distribution: The analysis of job titles among the sample of 198 employees reveals the following distribution:

Table 2: Job Title Distribution



Job Title	Frequency	Percentage (%)
Director	5	2.5%
Deputy Director	13	6.6%
Manager	20	10.1%
Engineer	30	15.2%
Supervisor	20	10.1%
Technician	50	25.3%
Operator	60	30.3%

Source: *Prepared by the researchers based on the outputs of the SPSS 22 program*

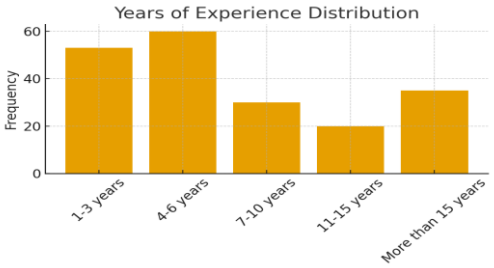
Operators constitute the largest group in the sample, representing 60 employees (30.3%), followed by technicians with 50 employees (25.3%). Engineers account for 30 employees (15.2%), while managers and supervisors

each represent 20 employees (10.1%). Deputy directors make up 13 employees (6.6%), and directors form the smallest category with 5 employees (2.5%). The most frequent job title (mode) is **Operator**, indicating that the workforce is predominantly composed of technical and operational roles—reflecting the structure and operational needs of Global Agri-Food and Kotama Agri-Food.

4. 1-2-Years of Experience Distribution: The respondents' years of experience in supply chain management are categorized as follows:

Table 3: Years of Experience Distribution

Years of Experience	Frequency	Percentage (%)
1-3 years	53	26.8%
4-6 years	60	30.3%
7-10 years	30	15.2%
11-15 years	20	10.1%
More than 15 years	35	17.7%



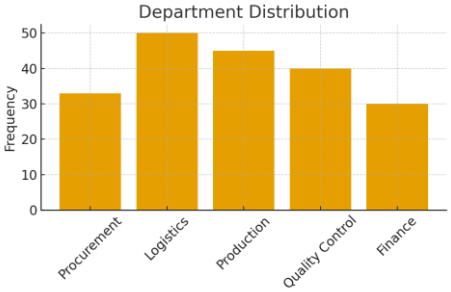
Source: *Prepared by the researchers based on the outputs of the SPSS 22 program*

The most common experience range is 4–6 years (60 employees, 30.3%). Employees with 1–3 years follow with 53 employees (26.8%). Those with more than 15 years of experience constitute 35 employees (17.7%). 7–10 years represents 30 employees (15.1%), while the smallest category is 11–15 years with 20 employees (10.1%). The median experience level is approximately 5 years.

4. 1-3-Department Distribution: The employees are distributed across different departments as follows:

Table 4: Department Distribution

Department	Frequency	Percentage (%)
Procurement	33	16.7%
Logistics	50	25.3%
Production	45	22.7%
Quality Control	40	20.2%
Finance	30	15.2%



Source: *Prepared by the researchers based on the outputs of the SPSS 22 program*

Logistics is the largest department in the sample, with 50 employees (25.3%). Production follows with 45 employees (22.7%), and Quality

Control accounts for 40 employees (20.2%). Procurement includes 33 employees (16.6%), while Finance represents 30 employees (15.1%). The mode of the department distribution is Logistics.

4. 2-Data analysis and hypothesis testing:

First, the results of descriptive statistics of the data relating to Independent Variables (Supply Chain Resilience)

Table No. (05): Averages and standard deviations (Supply Chain Resilience)

Number	Statement	Arithmetical Average	Standard Deviation	Materiality Level	Rank
1	The company has the ability to rapidly adapt to supply chain disruptions.	4.41	0.569	High	3
2	The company maintains stable operations during unexpected crises.	4.39	0.546	High	4
3	The supply chain responds effectively to changes in market conditions.	4.13	0.837	High	7
4	The company has reliable alternative suppliers and contingency strategies.	4.24	0.738	High	6
5	Collaboration with partners enhances preparedness for disruptions.	4.3	0.743	High	5
6	The company recovers quickly from supply chain disturbances.	4.47	0.694	High	1
7	Real-time information sharing strengthens supply chain resilience.	4.41	0.703	High	2

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Source: *Prepared by the researchers based on the outputs of the SPSS 22 program*

The analysis shows a high level of supply chain resilience in Global Agri-Food and Kotama Agri-Food, with an overall mean of 4.35. The strongest result is the companies' ability to recover quickly from disruptions (4.47), followed by the role of real-time information sharing (4.41). The lowest score relates to responsiveness to market changes (4.13), though it still reflects a high level of resilience. Overall, the findings highlight strong recovery capacity, operational stability, and information flow, while indicating the need to improve responsiveness and contingency planning to further strengthen supply chain resilience.

Table No. (06): Averages and standard deviations (National Food Security Contribution)

Number	Statement	Arithmetical Average	Standard Deviation	Rank
8	The company contributes to maintaining stable food availability in the Algerian market.	4.374	0.698	1
9	The company supports continuity of food supply during crises.	4.308	0.773	3
10	The company's logistics operations ensure consistent distribution of essential food products.	4.268	0.647	4
11	The company helps reduce risks of supply shortages for consumers.	4.086	0.863	5
12	The company contributes to maintaining stable food prices through reliable supply.	3.944	0.938	6
13	The company contributes to maintaining stable food prices through reliable supply.	4.318	0.714	2

Source: *Prepared by the researchers based on the outputs of the SPSS 22 program*

The results show that Global Agri-Food and Kotama Agri-Food make a strong contribution to national food security, with an overall mean of 4.22. The highest score relates to maintaining stable food availability (4.374), followed by stabilizing prices through reliable supply (4.318), and ensuring continuity during crises (4.308). The lowest-rated item concerns reducing risks of supply shortages (3.944), indicating room for improving risk-mitigation efforts. Overall, the findings confirm that both companies significantly support food availability, price stability, and supply continuity, while enhanced contingency planning could further strengthen national food security.

4. 3-The First Sub-Hypothesis Test

This hypothesis states: "There is a statistically significant effect of Supply Chain Resilience on National Food Security in Global Agri-Food and Kotama Agri-Food in Algeria."

Table (07): Simple Regression Results

Statement	R	R^2	T	B	Sig
The impact of supply chain resilience on national food security	0.652	0.425	12.84	0.781	0.000

** Statistically significant at the level of correlation (0.05 α) if Sig < 0.05.*

The statistical results show a significant effect of supply chain resilience on national food security (Sig = 0.000 < 0.05). The correlation coefficient (R = 0.652) indicates a strong positive relationship, while the coefficient of determination (R^2 = 0.425) shows that 42.5% of the variation in food security is explained by resilience. The impact coefficient (B = 0.781) and t-value (12.84) confirm a meaningful positive effect. These findings support the first hypothesis, demonstrating that stronger resilience capabilities—such as rapid adaptation and stable operations during crises—directly enhance food security in Algeria.

4. 4- The Results :

The findings show that supply chain resilience plays a significant role in strengthening national food security in Global Agri-Food and Kotama Agri-Food. Descriptive results indicate high levels of resilience across all indicators, with mean values above 3.68. The strongest aspects relate to ensuring stable food availability (Mean = 4.374) and maintaining stable prices (Mean = 4.318), while reducing risks of shortages scored slightly lower (Mean = 3.944).Regarding food security, respondents confirmed that both companies contribute notably through continuous availability, price stability, reduced shortage risks, strong logistics, and accessible distribution.Regression analysis supports the main hypothesis, showing a strong positive effect of supply chain resilience on national food security (R = 0.671; R^2 = 0.450; B = 0.812; Sig = 0.000). These results demonstrate that enhancing resilience capabilities will further strengthen Algeria's national food security.

5. Conclusion :

This study examined how supply chain resilience influences national food security in Global Agri-Food and Kotama Agri-Food. The results show that both companies demonstrate strong resilience capacities, particularly in rapid recovery, information sharing, and operational stability. Statistical analysis confirms a significant positive effect of supply chain resilience on national food security, explaining key improvements in food availability, price stability, and supply continuity. While resilience practices such as adaptability, responsiveness, redundancy, and efficient logistics play a central role in protecting the food system, the findings also reveal the need to strengthen responsiveness to market fluctuations and further reduce risks of supply shortages. Overall, the study emphasizes that enhancing supply chain resilience is vital for reinforcing Algeria's food security and ensuring the long-term stability of its agri-food system.

6 . Recommendations : Based on the study's findings, the following key recommendations are proposed to strengthen supply chain resilience and support national food security:

1. Enhance Real-Time Information Systems: Reinforce Risk Management.
2. Improve Market Responsiveness: .Upgrade Logistics and Storage Infrastructure.
3. Promote Supply Chain Collaboration..
4. Adopt Modern Technologies.
5. Align with National Food Security Policies.

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