

The Digitization Strategy of Agri-Food Businesses as a New Approach to Sustainable Development in Algeria.

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ملخص:

الرقمنة ضرورية لاستدامة صناعة الأغذية الزراعية في الجزائر. تعمل التقنيات الرقمية مثل الري الذكي والطائرات بدون طيار وأجهزة الاستشعار على زيادة الإنتاجية بشكل مستدام. يضمن تتبع المنتجات سلامة الأغذية ويقلل من الهدر. تقلل المبيعات عبر الإنترنت التكاليف والتأثير البيئي. بحلول عام 2024، ستعمل تقنيات الذكاء الاصطناعي وإنترنت الأشياء على تحسين الدقة الزراعية. ستسهل الحلول السحابية مشاركة البيانات. يساعد الاستثمار في هذه التقنيات الشركات على تحقيق أهداف التنمية المستدامة.

الكلمات المفتاحية:

الرقمنة، صناعة الأغذية الزراعية، الاستدامة، التقنيات الرقمية، الذكاء الاصطناعي، إنترنت الأشياء، التنمية المستدامة.

Abstract :

Digitization is essential for the sustainability of the Algerian agri-food industry. Digital technologies such as smart irrigation, drones, and sensors sustainably increase productivity. Product traceability guarantees food safety and reduces waste. Online sales decrease costs and environmental impact. By 2024, AI and the Internet of Things will improve agricultural precision. Cloud solutions will facilitate data sharing. Investing in these technologies helps businesses achieve the Sustainable Development Goals.

Keywords: Digitization, Agri-food industry, Sustainability, Digital technologies, Artificial intelligence, Internet of Things, Sustainable Development.

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1. INTRODUCTION

Digitization is one of the solutions for tackling the sustainability challenges that are confronting the agri-food industry in Algeria. Among others, the following digital technologies show promising opportunities:

Smart irrigation systems, drones, and sensors monitor the crop closely. It enables optimizing the use of inputs like water and fertilizers, thus raising productivity in a sustainable manner.

Traceability technologies enhance the traceability of food products from farm to table; this assures food safety and reduces waste, thereby reinforcing consumer confidence.

Online sales to consumers shorten the supply chain, reducing both the financial and environmental impacts of transport.

The use of online data from agriculture, production, logistics, and sales may be used to optimize all functions, reduce waste, and heighten profitability.

By 2024, AI will be refining precision agriculture, early detection of crop diseases, and optimization of supply chains. The Internet of Things-sensors, drones, etc.-will collect real-time data for increased efficiency. Secure cloud solutions will also foster sharing and collaborative data analysis.

Thus, through strategic investment in these enabler digital technologies, the agri-food businesses in Algeria will significantly contribute to the United Nations' Sustainable Development Goals through increasing food security and sustainable use of resources, while assuring long-term competitiveness.

Axes:

Introduction to digitization

The importance of the agri-food sector

The role of digitization of agri-food businesses in sustainable development

Importance and Key Objectives of the Study on the Digitization Strategy of Agri-Food Businesses in Algeria:

Importance of the study:

Some challenges keep arising from agri-food industries in recent decades and put extra environmental, food security, and economic profitability pressures.

Digitization represents a new opportunity for responding to these challenges and for pursuing sustainable development in this strategic sector of Algeria. Digital technologies could optimize the use of scarce resources like water, cut losses and waste, and make activities more productive and competitive.

It will also contribute to making the Algerian agri-food sector sustainable with respect to climate change and growth in population.

Objectives of the study:

Establish some digital technologies that are considered vital, such as precision agriculture, traceability, e-commerce, data analysis, and concrete applications in the field.

Evaluate the potential impact of those technologies on the sustainability of the environment, food security, operational efficiency, and economic profitability.

- A Roadmap and Strategic Recommendation that Algerian Agri-food businesses adopt a gradual shift toward the 'full' digitization process; Building awareness among both public and private decision-makers of the relevance of an investment in the Digital transformation for a Sustainable food Future, in Algeria;

2. The Concept of Digital and Digital Transformation of Agri-food Business

The Difference between 'digital transformation' and 'digitization'. (Bentaiba & Araba, 2022, p. 281)

2-1- Digital Transformation: A Technological Dimension:

Digital transformation means a neologism, designation of change initiated by digital technology and the Internet. Digital technology is opposed to the concept of analogy because it delivers information in the form of numbers, or numerus, in Latin, allowing doing calculations, statistics, or mathematical models. Thus, digitization allows analog data to be transferred to a digital form, for instance.

In practice and common vocabulary, digital transformation is very often preferred to speak of new technologies in their entirety. Here, we speak more readily of the technological process related to the transformation of a business. Concretely, digital transformation can include the establishment of new networks, connected devices, or even cloud storage.

2-2 Digitalization: A Much Broader Field:

The use of the word "digital" has been widely democratized along with the

explosion of internet use. The expression "digital transformation" is very often used to speak about the implementation of new processes and a new way of working, mainly within companies. We speak more about usage than hardware, especially in a professional context.

The digitization of businesses therefore refers to the use of new digital technologies (hardware, software applications, etc.) and their integration into the daily lives of employees and the company. Digital transformation encompasses digitization.

2-3- Digital Transformation: A Radical and Cultural Change:

While businesses have been integrating new information and communication technologies for decades, digital transformation goes further by intruding into the business model (economic model) of companies and their processes. Generalization of the Internet and integration into the functioning of the business can be expressed in various very concrete ways, such as mobility of employees through mobile devices and online storage solutions. Easier collaboration and working remotely mean, in an organizational development strategy, this is a real asset for a radical transformation of the business and its economic model.

3- The New National Strategy for Agro-industry Development in Algeria

3-1-Presentation of the New Strategy

A new strategy has been proposed during the National Agro-Food Industries Conference, prepared with the contribution of stakeholders. It aims to promote firms in this industry by developing, modernizing, and upgrading their standardization and regulations at the international level.

The main pillars of this national strategy are the control and reduction of import bills, the diversification of the national economy-especially in light

of the recent hydrocarbons price crisis-and the strengthening of national sovereignty through the assurance of food security.

This new strategy will promote endogenous growth and encompasses a financing mechanism in addition to the creation of an observatory for agro-industries. It also focuses on capacity building within the sector.

It is structured around a National Plan for the Development of Agro-industries, PND-IAA, which includes diagnosis of all sub-sectors, analysis of growth prospects, and a priority action plan. The strategy has five major pillars, which are intended to achieve six strategic objectives.

3-2. The Five Main Pillars of the Strategy

The essential pillars of this strategy have been summarized as follows (Tebani, 459):

a-Import Substitution: This first pillar builds on the potential national demand for the products of agro-industry, which is now satisfied for the most part by imports. Emphasis is placed on mobilizing hidden agricultural potential through increased agricultural production and enhanced intersectoral linkages between agriculture and industry.

b-Modernizing Enterprises in the Sector

The second pillar aims to guide companies toward external markets. To this end, it promotes the development of agricultural research and technology, enterprise networking, and the encouragement of foreign direct investment and partnerships to boost competitiveness.

c-Promoting Exports of Agro-based Products

This third pillar is essential for the diversification of the national economy. It advocates for particular support and guidance systems for agro-industrial enterprises, regularly adapted to take advantage of export potential in

products with clear comparative advantages.

d-Territorial Anchoring of Enterprises

The fourth pillar aims at the optimization of value chains and pooling efforts and resources, especially technological ones, through the creation of agro-food technopoles.

e-Setting Up an Institutional Coordination Framework

The last pillar is the creation of an institutional framework for the coordination and harmonization of public policies to take care of the inefficiencies of the sector and the dispersion of efforts.

3-3. Objectives of the Strategy

Among the strategic objectives of this new strategy are the following:

Increase the Contribution of Agro-industries to Industrial GDP

It will increase the contribution of agro-industries from 50% of the industrial GDP to 60% by 2024.

a- Expanding the Agro-industrial Network

The goal is to have 500 companies, each employing 200 people, for a total of about 100,000 jobs.

b-National Production and Import Substitution

To integrate more national production in the agro-industrial value chain, the dependency on imports has to be decreased.

c-Improvement of Enterprises

The goal is to upgrade 500 enterprises; 200 should be ISO 22000 accredited and thus export-ready.

3-4- Strengthening Export Capacities

It seeks to expand the exports in agro-industries from \$120 million to \$1.2 billion.

Improving Managerial Competencies and Human Resource Qualifications

The strategy also addresses the development of management competencies and qualifications of human resources for growth and competitiveness at sector level.

4- The Role of Digitization of Agri-food Businesses in Sustainable Development

Research and Innovation: Agricultural research and innovation are necessary to improve crop yields, variety development for drought resistance, and improved farming practices. More collaborations between research institutions, universities, and private sectors to develop environmentally sustainable technologies should be encouraged (Rabehi & Kermia, 2024, p.536).

Capacity Building and Education: There is a need for the government to offer training programs and education to farmers to enhance their capacities. Training shall include modern techniques of agriculture, sustainable agriculture, and use of technology.

Collaboration and Partnerships: Countries should form regional and international partnerships in sharing knowledge, expertise, and resources towards the attainment of common objectives in food security.

Regional Cooperation: Regional cooperation can be helpful for the Arab countries by sharing expertise, trading agreements, technology transfer, and agricultural investments.

5-Conclusion

This study highlights the role of digitization in the agri-food sector in Algeria as a strategic avenue to sustainable development. Adoption of digital technologies is indispensable to improve productivity, achieve food

security, and maintain competitiveness over the long term. Digital transformation, therefore, ensures proper resource management, reduced wastages, and optimization of operations at every value addition stage of the chain.

6- Key Findings

Key Technologies: The adoption of such technologies as smart irrigation, drones, sensors, and traceability systems contributes much to enhancing operational efficiency and sustainability.

Food Security: Traceability technologies promote food safety and reduce waste.

E-commerce: Online sales lead to shorter supply chains, which not only cut costs but also environmental impact.

AI and IoT: Artificial Intelligence and the Internet of Things enhance farming precision and early disease detection, optimize logistics.

Cloud Computing: Cloud computing solutions enhance data security and enable better sharing for analysis.

7- Recommendations

The study proposes the following recommendations to advance digitization in Algeria's agri-food businesses:

Technological Investments: Companies should invest in digital technologies to maximize resource utilization, boost productivity, and remain competitive.

Research and Innovation: Promote agricultural technology research to develop sustainable and resilient solutions.

Training and Education: Develop training programs for farmers in modern agricultural techniques and digital technology usage.

Cooperation and Partnerships: Encourage partnerships between research

institutions, universities, and private sectors that can help in the adoption of technology.

Institutional Framework: Establish a coordinated institutional framework to harmonize the public policies and further the course of digitization in the agri-food sector.

8-Bibliography:

- Bentaiba, F., & Araba, R. (2022). The digital transformation of economic enterprises: Case study of the CRUSTASY micro-enterprise in Bousmail. *Revue Innovation*, 12(1), 479–497.
- Rabehi, F., & Kermia, N. (2023). The reality and challenges of achieving food security in Algeria during the period 2018–2023. *Journal of Al Mayadine Al Iktissadia*, 6(1), 521–539.
- Tebani, A. (n.d.). The agri-food industry in Algeria: Current state and future strategy. *Revue Droit et Sciences Humaines – Études Économiques*, 27(2), 459.