

SWOT ANALYSES OF PHARMACEUTICAL CLUSTER INDUSTRY IN ALGERIA

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Abstract:

This study aims to examine the constitution of Algeria's pharmaceutical industry cluster using the SWOT analysis method. This article presents a set of opportunities and strengths that support the establishment of a pharmaceutical industry cluster in Algeria as a recent strategy to enhance competitiveness and boost innovation in the manufacturing of pharmaceuticals. It's also seeks to provide a comprehensive understanding of the factors affecting the current and prospective status of the pharmaceutical cluster, offering insights into the critical issues and challenges pertinent to its development. The results of the study show us that Algeria has abundance of natural resources, which can be leveraged to create new economic ventures. Furthermore, strengths include collaborations and agreements with other countries in the pharmaceutical business, while the major weaknesses are the lack of technology and innovation, as well as a reliance on raw material imports for domestic production.

Keywords:SWOT analysis, pharmaceutical cluster industry, Algeria.

JELClassificationCodes :F63, F64, C19, R11.

Résumé :

Le but de cette étude est d'exposer, à l'aide de la méthode SWOT, la constitution du cluster industriel pharmaceutique en Algérie. Cet article

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présente un ensemble d'opportunités et de forces qui font de la création d'un cluster de l'industrie pharmaceutique en Algérie une solution récente pour améliorer la compétitivité et promouvoir l'innovation dans la production de médicaments. Nous espérons également que cette étude des facteurs pertinents pour le statut actuel et futur du cluster pharmaceutique fournira un bon aperçu des principales questions et préoccupations pertinentes pour comprendre et faire progresser ce cluster. Les résultats de l'étude nous montrent que l'Algérie dispose de nombreuses ressources naturelles qui peuvent être valorisées dans de nouvelles entreprises. En outre, les atouts résident dans la coopération et les accords avec d'autres pays dans le domaine de l'industrie pharmaceutique, tandis que les principales faiblesses sont le manque de technologie et d'innovation et une production nationale dépendante de l'importation de matières premières.

Mots clés : analyse SWOT, cluster industriel pharmaceutique, Algérie.

JEL Classification Codes : F63, F64, C19, R11.

1- Introduction:

In the context of a market economy, competitive commitment pushes countries to differentiate themselves by developing comparative advantages on a national scale. The challenge is to attract investors from around the world to produce added value locally. Nonetheless, industrial businesses—in particular, small and medium-sized enterprises (SMEs)—are crucial to the development of market economies. For this reason, it is imperative to consider SMEs' promotion as a crucial component of economic growth (Djema, 2014). It turns out that in Algeria, the change in the SME population between 2018 and 2019 was 4.5% in all formal sectors combined, representing a total net increase of 51,476 SMEs. The service sector has experienced the most significant business creation growth over the two years at 51.48%, totalling 614,375 SMEs. In second position are artisanal activities with 23.01% and SMEs in the BTPH sector, which account for approximately 16% of all SMEs, occupy the third position. However, industrial SMEs are in fourth position, numbering 103,693 at the end of 2019, compared to 99,938 entities at the end of 2018, an increase of 8.69% (bulletin information statistique de l'entreprise, 2020).

In comparison to 2019, the number of SMEs created during the 2020 fiscal year fell by a significant 24%, from 57,642 in 2019 to 43,558 in 2020. The worldwide health crisis is the result of this. Since then, the Algerian government has announced significant structural changes meant to hasten the shift to an economic development model driven by

the private sector. The government has put in place a number of measures to aid enterprises and give them urgent support. These supports measures include lowering the mandatory reserve rate from 10% to 3%, reducing the Bank of Algeria's primary important interest rate from 3.5% to 3%, and decreasing contractual deadlines and penalties for businesses experiencing delays in public projects (Bulletin information statistique de la PME; 2021).

To compete, companies must, however, improve their competitiveness, or their capacity to sell profitably and sustainably. Establishing networks as a means of mutual assistance among SMEs is one way to become competitive. This approach is founded on the ideas that a group of companies is more capable than a single company and those collaborative efforts provide resources that an individual company cannot access (Idir, 2020). According to a number of studies, companies that operate in networks are able to address specific issues collectively, boost their competitiveness and innovation potential on the one hand, and form alliances and partnership on projects that they otherwise could not have completed on their own (Beniani, 2017). As a result, the company network is a specific type of economic interaction that is founded on rules that regulate all of the actors. In order to help physically adjacent businesses, grow and develop, networks aim to foster collaboration between them (Idir, 2020). We are interested in the case of clusters among the various types of networks that exist since they are one of the most efficient ways to ensure industrial domination in both developed and developing nations through collective forms of production (Djouab, 2018). In order to promote innovation and ongoing production process improvement, clusters are an alternate mode of cooperation for small and medium-sized businesses (SMEs), which are distinguished by intense competition. This competition inside clusters does not rule out the prospect of strong collaboration between different players through information exchange and the implementation of collaborative projects in a variety of fields, such as marketing, research, and procurement. (2019, Makhtari).

Understanding the definition of the cluster would therefore be crucial. Generally, according to Mr. Porter the cluster is a geographic concentration of interconnected companies that compete and cooperate with specialized suppliers, service providers, companies from related industries and associated institutions (such as universities, agencies standardization or professional organizations) in a specific field (Atik, 2018). We summarize, as stated in the definition above, that Clusters are a competition poles.

Algeria's pharmaceutical cluster is made up of a web of interrelated actors. Pharmaceutical labs, both domestic and foreign, are at the center of this cluster, ensuring the manufacturing of both specialty and generic medications. An ecosystem of distributors, package manufacturers, and suppliers of raw materials supports these businesses. In this cluster, research and development organizations are also quite important. To foster innovation and develop a trained workforce, they collaborate closely with universities and training centers. International standards compliance and quality control are guaranteed by regulatory agencies like the National Agency for Pharmaceutical Products.

Moreover, given that clusters are essential for evaluating and improving the performance of industrial companies, it would be beneficial to research how Algeria's pharmaceutical sector makes use of clusters ?

The paper will aim to analyse the formation of pharmaceutical clusters in Algeria using the SWOT method. To accomplish this goal, we will start with a summary of Algeria's pharmaceutical sector and its current situation before talking about the creation of pharmaceutical clusters. Lastly, we will apply the SWOT analysis to identify opportunities that could enhance the pharmaceutical industry's situation.

2- The current situation of the Algeria's pharmaceutical sector:

Because of its substantial economic influence and representation of the health and well-being of all Algerians, the pharmaceutical industry is considered a vital and strategic sector by the country's state authorities (Bessouh, 2017). Long-term technology advancements are crucial to this sector, and each stage could cost a company hundreds of millions of dollars(\$). After marketing, a company's drugs must be among the top five in the market to generate profitable returns on their investments (Rapport sectoriel ; l'industrie pharmaceutique ; 2011).

The Algerian government encourages domestic production through incentive measures, as confirmed by the 2018 health law under executive decree.

According to Article 205, the State guarantees that everyone on the nation's soil has access to medications and medical equipment, particularly those that are essential. In the manufacturing, importing, exporting, distributing, and dispensing of medications and medical

equipment, it also ensures that efficiency, safety, and quality criteria are met. Additionally, it makes sure that medications are used sensibly and that generic medications are promoted.

In particular, the State promotes investment in pharmaceutical research and development and supports domestic production through incentive measures (Article 206).

In 2019, 50% of Algeria's population's pharmaceutical demands were met by domestic manufacture, demonstrating the country's successful pharmaceutical sector. This manufacturing has grown rapidly, and by 2022, it will have met around 70% of the nation's generic needs. Nonetheless, the remaining 30% is made up of difficult-to-develop unique products. The pharmaceutical import bill has been significantly decreased, falling from \$2 billion USD in 2019 to 1.2 billion USD in 2021. The pharmaceutical industry has proven to be capable, despite these challenges, as seen by ongoing projects, state-of-the-art healthcare facilities, and successful businesses that exhibit both internal and external growth (Rapport annuel, 2019; Biopharm).

It's interesting to note that 15 laboratories dominate the pharmaceutical industry in Algeria. In the Algerian market, these companies have sold pharmaceutical products totaling up to \$2.9 billion. The French business SANOFI is at the top of the pack; by the end of 2021, its revenues in Algeria will have exceeded \$368 million. Novo Nordisk, a Danish company with sales of about \$258 million, came in second. With revenues of \$205.70 million at the end of 2021, the El Kendi group, a division of the Jordanian MS Pharma group, came in third with an 11.97% market share. Another Jordanian company, HIKMA Pharmaceuticals, comes in at number four with sales close to \$160 million. Biopharm Laboratory, the top-ranked Algerian firm, has \$102 million in sales and is in fifth place. It should be mentioned that SAIDAL, a government-owned company, ranks eleventh with sales of slightly more than \$65.7 million. (<https://algeriepart.com/exclusif-sanofi-el-kendi-novo-nordisk-et-les-autres-les-15-laboratoires-pharmaceutiques-qui-dominent-le-marche-du-medicament-en-algerie/>).

Between 1990 and 2021, Algerians' consumption needs increased from 375 million dollars in 1990 to 4.3 billion dollars in 2021, and these sales mostly serve their needs. The demographic shift, the growth of social coverage, the rise in living conditions, and the increased accessibility of both public and private healthcare services are all contributing factors to this increase (Ziani, 2021).

3- The creation of pharmaceutical clusters in Algeria:

Pharmaceutical clusters are starting to form in Algeria. At the moment, two noteworthy clusters in Algiers stand out. The first came about as a result of a research proposal that was founded on a statistical analysis carried out in the study by AtikMaatouk (AtikMaatouk, 2018), which recommended 17 industrial cluster projects across the nation. The majority of these are found close to sizable cities that meet the requirements for both aesthetic appeal and the accessibility of necessary and scientific infrastructure. Additionally, the second cluster showcases Sidi Abdellah's sizable biotechnology pole.

3-1. A cluster in chemical industries in Algiers:

Which is made up of the following companies: The Company (SAIDAL) and its foreign partners-RHONE-POULENC (France), PFIZER (USA), European Pharmaceutical Group (GPE), NOVO NORDISK (Denmark) and Pierre Fabre (France). ENGI (specialized in the production of Industrial Gases and MOUBYDAL (specialized in Pesticides) (Dar El Beida ALGIERS). Other partners will be part such as the National Institute of Hydrocarbons and Chemistry of the University of Bougara of Boumerdès and the Faculty of Pharmacy of Algiers (Atik, 2018).

3-2. The creation of the biotechnology pole in Sidi Abdallah:

Algeria has started the development of an ecosystem (cluster) innovation that unites a wide range of stakeholders within the framework of public-private partnerships (PPPs) in order to foster regional development and industrial competitiveness. This is part of the policy to reduce imports and encourage domestic production through partnerships with global pharmaceutical industry leaders. PPPs are a way for a biotechnology center to coordinate its overall development plan. After Boston, Dublin, and Singapore, this biotechnology center in the new town of Sidi Abdallah is the fourth in the world (Ferdj, 2017). Situated in the technopole of the new city of Sidi Abdellah (Algiers), the Algerian-American regional center for biotechnology and medication manufacture is housed in a complex that includes university campuses, a hospital, and research and technology institutes. In partnership with U.S. pharmaceutical labs, the project seeks to create a regional center of excellence for biotechnology in Algeria. The goal of this center is to act as a hub for the Middle East and Africa, much like other regional centers like those in Singapore and Ireland. The labs in question are MSD/Merk,

Bayer, Janssen-Cilag, Roche, Abbott, Pfizer, Amgen, Novartis, and Eli Lilly.

Until March 2022, the Minister of the Pharmaceutical Industry announced the upcoming launch of the biotechnology, generic drug development and cell culture pole in Sidi Abdallah. He affirmed that the pole is still in the construction phase, as part of the development strategy of a complex which is mainly based on the commercial policy based on the enrichment and diversification of product ranges, and the orientation, in particular towards new therapeutic axes as well as the development of the partnership(<https://esseha.dz/bientot-un-centre-de-recherche-et-developpement-des-medicaments-generiques-et-biotechnologie-a-sidi-abdellah/>).

4- The application of the SWOT method for pharmaceutical clusters in Algeria:

A strategic planning method that offers evaluation tools is the SWOT analysis. It gathers information from both internal sources (the system's strengths and weaknesses) and external sources (opportunities and threats), which may have unpredictable effects on decisions.

Table N° 1: SWOT matrix of the pharmaceutical cluster in Algeria

Strengths	Weaknesses
- The granting of land bases - Human resources Availability - A quality local market - The potential market's geographic proximity: Europe and Africa - Foreign business investment reforms: - A substantial number of pharmaceutical establishments - Guidelines for safe production methods for pharmaceuticals used in human medicine - Pharmaceutical product control. - Strengthening of the regulations governing the registration of medicines - Joint ventures between national and foreign pharmaceutical laboratories - Significant production	- Import of raw materials - Lack of Technology and Innovation - A poorly designed policy to encourage national production - Non-reimbursement of medications - The land constraint - Financial constraint in Algeria - The lack of industrial pharmacists
Opportunity	Threats
- Export consortia - Technical centers - Exchange platform between clusters	- Fierce competition - Regulatory instability

Source: realized by the authors

5- Discussion of the SWOT results:

5-1. Strengths:

a. The granting of land bases: Restoring the national industrial land agency will improve access to and administration of industrial land for the construction of factories and manufacturing facilities.

b. Human resources Availability: The success of drug production labs is mostly dependent on human resources. According to human resources managers in several laboratories, such as Biopharm, have strengthened their human resources management policy for years in order to develop human capital. They have also signed agreements with universities and major schools, the aim of which is to develop the skills of these employees (Biopharm report, 2019).

c. A quality local market: The Ministry of Health reports that over 70% of pharmaceutical production is covered in 2022, and the national market is expanding comparatively. However, while being driven by generics, the African pharmaceutical sector is still under-penetrated when compared to similar generic-driven economies (such as China and India). Because they are more economical than originators and because patients have less faith in the quality of generic drugs, generics are crucial to the supply of medications (Kerrar.a, 2022). They can also be manufactured by new market entrants.

d. The potential market's geographic proximity: Europe and Africa: Algeria's geographic location is a major factor in the expansion of its investment potential. Algeria is actually located at the intersection of the Arab, African, and European continents. Foreign laboratories should find the Algerian market more attractive due to its good geographic location. It is anticipated to encourage the expansion of large investments from important corporations, like the American Pfizer, the Swiss Novartis, the British GlaxoSmithKline (GSK), and the French business Sanofi-Aventis (BESSACHI.F, 2021).

e. Foreign business investment reforms: Law No. 22-18 of 25 Dhou El Hidja 1443 corresponding to July 24, 2022 relating to investment Art. 2. — The provisions of this law aim to encourage investment in order to:

- Develop priority sectors of activity with high added value;
- Ensure balanced and sustainable territorial development;

- Enhance the value of natural resources and local raw materials;
- Promote technology transfer and develop innovation and the knowledge economy;
- Generalize the use of new technologies;
- Encourage the development of human resource skills and the creation of sustainable jobs;
- Strengthen and improve the nation's export potential and economic competitiveness.

f. A substantial number of pharmaceutical establishments:

Algeria has become one of Africa's top producers of pharmaceuticals in a matter of decades. With 69 new investment projects planned, including 42 pharmaceutical manufacturing projects and 27 medical equipment production projects, there were nearly 196 pharmaceutical companies operating in the production field, including 137 that were specialized in producing drugs to meet more than two-thirds of the country's needs (<https://www.financialafrik.com/2023/04/14/le-secteur-pharmaceutique-en-algerie-un-enjeu-majeur-pour-le-developpement-du-systeme-de-sante/>).

The most important pharmaceutical production laboratories in Algeria are:

One of the earliest private pharmaceutical laboratories in Algeria, **Genericlab** is based in Rouiba and has been in operation since 1992. It specializes in producing generic medications. Ophthalmology, Neuropsychiatry, Allergology, Cardiology, Pediatrics, Gastroenterology, Endocrino-diabetology, Food Supplements, Rheumatology, Orthopedics, and Urology are among the disciplines from which the company offers more than 54 products (<https://genericlab.com/presentation-entreprise/>).

Frater-razes are produced in accordance with good manufacturing principles (GMP) using the newest generation of industrial instruments from Northern Europe. Sources of raw materials More than thirty years after the European, English, and American pharmacopoeias' "ICH" standards were established; a complex of production facilities and therapeutic areas with state-of-the-art technology has arisen. One of the labs in Algeria that produces biosimilars is Frater-razes, which has all the biotechnological industrial facilities required to cover the full process that is necessary for the creation of biosimilars (<http://frater-razes.com/>).

The government laboratory Saidal, which is focusing on Africa to promote the development of an integrated continental sector with specialized regional poles, should not be overlooked in addition to the

Biopharm and Biocare laboratories. The French corporation Sanofi is the leader in worldwide foreign laboratories, having built the biggest pharmaceutical production and distribution facility in Africa at Sidi Abdallah (Algiers). Other noteworthy organizations include the American pharmaceutical corporation Pfizer, the Swedish-British pharmaceutical firm Astra Zeneca, the Danish group Novo Nordisk, the El Kendi group (a subsidiary of the Jordanian business MS pharma), and HIKMA Pharmaceuticals (another Jordanian group).

g. Strengthening of the regulations governing the registration of medicines: Date to June 30, 2022, and are described in Executive Decree No. 22-247 of AouelDhou el Hidja 1443. This decree establishes the following guidelines for excellent manufacturing processes for pharmaceuticals used in human medicine.

According to **article 4**, Good manufacturing practices are one of the components of quality management that guarantee pharmaceutical products are produced and regulated consistently in accordance with the quality standards suitable for their intended use and mandated by the clinical study authorization, registration decision, or product specifications. According to **article 5**, pharmaceutical establishments are required by the relevant authorities to implement good manufacturing procedures for pharmaceutical products for which they serve as a regulatory reference. The pharmaceutical quality system, staff, facilities and equipment, documentation, production, quality control, outsourced operations, complaints, batch recall, and self-inspection are all components of good manufacturing practices, according to **article 6**.

h. Pharmaceutical product control: From the acquisition of raw materials to their transformation into finished goods, quality control is a procedure that monitors the whole pharmaceutical supply chain. It is a government-run observation system that guarantees the quality of all pharmaceutical products.

Consumer safety is the primary goal of the National Laboratory for the Control of Pharmaceutical Products (LNCPP), which was founded in 1993. This is accomplished through the regulation of pharmaceutical items, the examination of medical supplies found in both public and private pharmacies, and the expansion of medical equipment control in these pharmacies. In order to control and assess the efficacy of generic medications in comparison to their original counterparts, the LNCPP has been conducting bioequivalence trials since October 2007. Apart from this control laboratory, pharmacist inspectors have been established to oversee pharmacies, their annexes, pharmaceutical product depots, and establishments involved in the manufacturing,

importing, and/or marketing of pharmaceutical products. They also make sure that all legal requirements pertaining to pharmacy practice are met.

i. Strengthening of the regulations governing the registration of medicines: In accordance with the provisions of Articles 22 and 23 of Executive Decree No. 20-325 of 6 Rabie Ethani 1442, dated November 22, 2020, concerning the registration procedures for pharmaceutical products, the objective of this decree is to establish the pre-submission application template and the application review procedures for pharmaceutical products that are subject to registration. In accordance with Article 5, the National Pharmaceutical Products Agency's relevant departments review the admissible pre-submission application for registration and have thirty (30) days from the date of admissibility to determine if the application is acceptable.

j. Joint-ventures between national and foreign pharmaceutical laboratories: Following the establishment of joint ventures—industrial agreements pertaining to the joint realization with foreign laboratories such as Pfizer, Sanofi, Dar El Dawa, Novo Nordisk, Cipla, and Astra Zeneca—and other businesses like Generic Lab, Frater-Razes, and Niomedic, Saidal Laboratory has emerged as a legitimate pharmaceutical manufacturer (Bellahcene, 2022).

k. Significant production: Local output has changed significantly since the government decided to lower import prices in order to safeguard domestic production. Pharmaceutical operators are now required to invest in local production as a result of new government measures brought about by the ministerial decree of October 30, 2008, which established a specification of technical conditions for the importation of pharmaceutical products and medical devices intended for human medicine. Additionally, it has prohibited the importation of domestically made medications. The government hopes that these new rules will decrease drug prices by reducing the volume of imports (rapport sectoriel n°1 industrie pharmaceutique, 2011). Over 70 percent of the local market's needs for generic medications in 2022 can be met thanks to the expansion in local production. The Algerian government also supports the creation of generic medications in an effort to lower health care costs because they are less expensive to produce than original medications and don't require research and development. Using the same example, the coverage by local production of the primary local strategic market segments is 96% for COAPP Cardiovascular, which is produced in Algeria and compared to 3% import, DO Dermatology, which is produced locally at a rate of 52% versus 32% import, and NO Nervous System, which is produced locally at a rate of 78% versus 21% import (Kerrar, 2022).

5-2. Weaknesses:

The pharmaceutical industry, whether public or private, encounters numerous challenges that impede its growth. These challenges are not unique to the pharmaceutical sector but also reflect the broader investment climate in Algeria. Some of these constraints include:

a. Import of raw materials: Nearly all raw materials are imported to sustain local production, which is mostly concentrated on the development of generics and certain specialties (the tenets of large laboratories). Imports decreased in 2009 because the government decided to prohibit the importation of medications made in Algeria in large enough numbers. Although significant, this decline is nevertheless a barrier to encouraging domestic pharmaceutical manufacturing.

b. Lack of Technology and Innovation: Development in the pharmaceutical industry is dependent on long technological horizons, requires a technological base (set of knowledge and know-how), which national public or private actors have not previously constituted. The absence of this technological base constitutes a serious handicap for actors in the pharmaceutical sector in Algeria, where it is necessary to conclude industrial partnership agreements providing for a transfer of technology in order to promote national production.

c. A poorly designed policy to encourage national production: The national drug manufacturer is penalized to the point where they must produce a minimum of three industrial batches of a new product before they can proceed with its registration and then ask to have it added to the list of medications that Social Security reimburses. The costs of manufacturing and storing the product remain his responsibility for the entire period during which this request is processed, which is extremely costly and unpleasant. The national producer is also penalized since in Algeria, the drug importer will pay 5% tax on the finished product, while the producer will pay a 35% levy on raw materials from abroad. It is clear that a potential operator will have more incentive to import the finished product than to invest in production.

d. The lack of industrial pharmacists: Higher education institutions are not closely associated with the pharmaceutical industry. Although the manufacturing requirements mandate the presence of specialist (industrial) pharmacists, the latter is restricted to community pharmacist training. This suggests that community pharmacists who have gained expertise on production sites are employed by pharmaceutical corporations, requiring them to spend in their training, which results in extra costs (Ziani, 2021).

5-3. Opportunities:

a. Export consortia: An export consortium can be considered as a formal strategic cooperation, in the medium or long term, between companies. It acts as a service provider whose specialty is to facilitate access to foreign markets. The industrial sectors, particularly the agri-food sector, will be strengthened by the creation of competitive and competitive export consortia that advantageously combine know-how, international influence and adaptability. Three (03) consortia are legally constituted; four (04) others are in the process of being constituted.

The consortia constituted are:

- Agro Cereals (ACC) which brings together six (06) companies;
- Interprofessional Group of Animal Proteins (GIPA) which brings together eight (08) companies;
- Consortium of Date Exporters is made up of eight (08) companies;

The consortia in the process of being constituted are:

- Territorial Consortium of Tlemcen which includes eight (08) companies;
- Algerian Consortium of Agro-Food Industries (ACIA) which brings together eight (08) companies;
- Consortium of Flavor Producers composed of eight (08) companies;
- A consortium of drinks Djazair Breuvage Export is made up of six (06) companies but not formalized.

In this regard, we propose the formation of an additional pharmaceutical company consortium in Algeria to strengthen business ties and increase export-oriented production.

b. Technical centers (CTI): Establishing a network of industrial technical centers is part of the Ministry of Industry and Mines' development objective. These facilities are intended to support high-potential companies such as the construction materials, packaging, agri-food, mechanical, electronic, chemical, textile, and leather sectors (Pommier, 2019). Establishing functional connections between the research sector and the actual technology needs of companies is made possible by the technical center, which is a vital resource for support and assistance.

Currently constructed technological centers include:

- The Technical Center for Mechanical and Metal Processing Industries (CTIME), located in Ain Smara, Constantine province, at the ENMTP site. (Executive Decree No. 10-2015 of September 16, 2010 establishing the industrial technical center for mechanical and metal processing industries);
- The Technical Center for Agro-Food Industries (CTIAA), located in Boumerdes. (Executive Decree No. 12-98 of March 1, 2012 establishing the technical center for agro-food industries).

Three technical centers are currently in the project phase including:

- A technical center for chemistry (CTIC). It will be located in Oran;
- A technical center for construction materials (CTMC);
- A technical center for electronics.

c. Exchange platform between clusters: The establishment of an exchange platform amongst clusters operating in different fields on the national market to assist one another in overcoming their shared issues was the subject of an agreement signed in Algiers in October 2019. These clusters, which are collections of businesses with complementary businesses, are found in the beverage, digital, precision mechanic, renewable energy, tourist, and date-making industries. Following a meeting at the Ministry of Industry and Mines headquarters, where Minister Djamilatamazirt was present, and representatives from six clusters signed the agreement, which aims to strengthen collaboration between Algerian clusters from different sectors and to work together on issues related to financing, taxation, and legislation. (<https://www.dknews-dz.com/>).

It would be more interesting at present to strengthen this agreement with other industrial clusters, particularly pharmaceutical ones. The goal is always to create operational relationships with maximum sharing of knowledge and know-how.

5-4. Threats:

Among the threats that influence the development of clusters in the pharmaceutical sector in Algeria we find :

a. Fierce competition: Threats to the growth of clusters in Algeria's pharmaceutical industry include the fierce competition from foreign labs, who own technologies, know-how, and product licensing

rights, and who, most importantly, have a long-standing monopoly on the domestic drug market. Our highly skilled professionals are operational, prepared to take on this competition, and especially capable of creating the best solutions for certain demands. The main obstacle is to get to the point where, in the near future, it is possible to think about exporting the goods produced by Algerian talent and human capital abroad, aside from the necessity of establishing a pharmaceutical sector that can satisfy domestic demands.

b. Regulatory instability: Investors and businesses in the industry may experience a climate of uncertainty due to regulatory instability, frequent changes in healthcare policies, and pharmaceutical laws.

6- Cluster Development Strategies:

To capitalize on their strengths and opportunities while mitigating their weaknesses and threats, pharmaceutical clusters in Algeria must adopt targeted development strategies. One of the priorities should be increased investment in research and development, in collaboration with universities and national research centers. This would help stimulate innovation and reduce dependence on technology imports.

Furthermore, establishing strategic partnerships with international pharmaceutical companies could facilitate technology transfer and access to new markets. It is also crucial to strengthen the continuing education of professionals in the sector to maintain a high level of expertise and adapt to rapid technological developments in the industry.

7- Conclusion:

Algeria's pharmaceutical industry has improved significantly in the last several years. Significant progress has been made since the state started to incentivize operators to increase their investments in this area. Because generic drugs are easier to make and need less research and development than name-brand ones, Algeria, like many other developed countries, has promoted their development. As a result, drug effectiveness has increased and medical expenses have decreased. Furthermore, the objective of the agglomeration strategy of drug production companies, particularly when it is implemented in the form of clusters, is to capitalize on opportunities such as the formation of export consortiums and potential markets, to counter threats such as the fierce competition from foreign companies, and to counter various

challenges such as the importation of drugs and a lack of innovation and technology.

In conclusion, our study has shown that Algerian industrial clusters are competitive due to the presence of specialized resources, a high-quality local market, and a diverse network of suppliers and linked sectors (BENIANI, 2017). Therefore, Algeria's pharmaceutical clusters appear to have a bright future. Clusters could be particularly prominent in the development of customized medicine, the digitization of the industry, and the use of cutting-edge technologies like artificial intelligence in pharmaceutical research.

Pharmaceutical clusters in Algeria have the potential to become significant participants on the global stage by leveraging these trends and enhancing their capacity for innovation, which would advance public health and the nation's economic diversification.

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