

Dynamic and emergence of Development Territorial, Algerian Cluster Study

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Abstract:

The objective of this paper is to analyse the emerging biotech cluster Sidi Abdallah (Algiers). We mainly focus on innovative clusters concept in the area of biotech as a mode of organization and agglomeration of innovation actors. The study uses data from fieldwork conducted in Sidi Abdallah biotech cluster involving several institutions (enterprises, ministries, research centres, universities) together with secondary data mostly from private and public organizations. We have come to the conclusion cluster policy is often ineffective in peripheral regions because of the scarcity of some determinants such as: intermediary institutions, regulatory framework, coordination between the different actors involved in the project, local demand, anchor firms, Insufficient cluster critical mass and slow cluster life cycle.

Keywords: Peripheral Clusters, Emergence, Territorial Dynamic, Algeria.

Jel Classification Codes : L10, O31, R10, R58

Résumé :

L'objectif de cet article est de discuter et d'analyser le cluster émergent biotech de Sidi Abdallah (Alger). Nous nous concentrons principalement sur le concept de clusters innovants dans le domaine des biotechnologies en tant que mode d'organisation et d'agglomération des acteurs de l'innovation. L'étude utilise des données issues de travaux de terrain menés dans le cluster biotech de Sidi Abdallah impliquant plusieurs institutions (entreprises, ministères, centres de recherche, universités) ainsi que des données secondaires provenant principalement d'organisations privées et publiques. Nous sommes arrivés à la conclusion que la politique de cluster est souvent inefficace dans les régions en raison de la rareté de certains déterminants tels que : institutions intermédiaires, cadre réglementaire, coordination entre les différents acteurs impliqués dans le projet, la demande locale, masse critique du cluster insuffisante et le cycle de vie du cluster lent.

Mots clés : Clusters Périphériques, Emergence, Dynamique Territoriale, Algérie.

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1. Introduction

Major advances in science have transformed biology, an explanatory science, into a science of economic interest, hence its industrialization over the last three decades (Douzou et al. 1993). It covers four fields of application: 1°food biotechnology, 2°biotechnology and health, 3°biotechnology and agriculture and 4°biotechnology and environment. In front of this growing use of biotechnology, many national and multinational companies often organize themselves with the help of public authorities and other intermediary institutions in the form of clusters for reasons of competitiveness and performance. Clusters have also become important in terms of policymaking, as they have been increasingly considered as drivers of economic growth and innovation, on the basis of the assumption that there are advantages to economic agents located in a cluster and that innovation is more likely to occur in clusters (Orsenig, 2005). Since the late 1990s, most industrialized and emerging countries, as well as many developing countries, have appropriated the cluster problem. This approach seems now to be an integral part of the key tools implemented in national and regional industrial and technological policies for development. The concept of cluster remains today the most used concept in theoretical research and in public policies (Jacquet and Dormon, 2005). Porter (1990), in his book *"The competitive advantage of nations"*, devoted much of his time for analyzing the industrial districts and the Silicon Valley. It is thought to be an instrument of public policy for promoting growth and competitiveness at sectoral and territorial level. The cluster concept is made up of a diverse set of actors from the public and private spheres: companies, research centers, suppliers, customers, public institutions and organizations, incubators, and diasporas, operating in a space geographical and organizational relationships. In 1990, Porter published *"The competitive Advantage of Nations"* in which he takes and develops the idea of Marshall (1890, 1930). He also defines it as a *"corporate geographic concentration interlinked, who compete and cooperate with specialized suppliers, service providers, firms in related industries and associated institutions (universities, regulatory agencies or professional organizations) in a particular field"* (Porter, 1990). Geographical concentration has been central to the idea of clustering from the beginning with the work of Marshall (1890). He argued that small firms can benefit from their co-location because they develop a common labor pool, profit from knowledge exchanges and cooperation and can rely on emergence of a large population of service and supplier firms in the region. While some approaches have attempted to undermine the importance of geographic agglomeration, there are some reasons why geographic proximity remains at the core of the cluster concept. Preissl and Solimene (2003) offer a very concise definition of innovative cluster as *"a set of organization and institutions that interact formally and/or informally through inter-organizational networks and varied among individuals, and contribute to achieving innovation in one area of activity, defined by specific fields of knowledge, skills and technologies"*. The recognition that clusters are spatially confined and influenced by local conditions should not, however, obscure the fact that they and the firms they encompass are situated in an increasingly globalized world. This means that even those in fairly remote areas are affected by global institutions and are often linked to actors in distant places. The analysis of clusters must increasingly take into account the ways in which global linkages affect local relationships (Meagher, 2005; Schmitz, 2004). In the words of Schmitz (1995a), a cluster is defined as a

sectoral and geographical concentration of enterprises. According to Ahedo (2001), regional development depends on the presence of public and private actors who play a catalytic role: regional and local governments; university; research institutes; a chamber of commerce; training organization; financial institutions. According to Malmberg and Maskell (2001) there are at least three factors that traditionally encourage spatial clustering: reduced costs of producing and maintain a dedicated infrastructure and other collective resources; well-functioning markets for specialized skills; reduced interaction costs for co-located trading partners. We focus on innovative cluster concept in the area of biotech as a mode of organization and agglomeration in Algeria. As Sidi Abdallah's biotech cluster is an organized cluster, the Algerian authorities have chosen this word to consider this type of innovation concentration at a territorial level (Ferdj and Hamadi, 2020). Clustering research has originally focused on the developed countries, but the concept is now increasingly applied to emerging and developing countries. The paper analysed the less often researched issues of cluster emergence and define the determinants of the process of emergence of the biotech cluster of Sidi Abdallah (Algiers). The literature cluster has paid less attention to the question how the clusters emerge in the developing countries. The article is organized as follows: First, salient characteristics of the biotech cluster of Sidi Abdallah are presented. In the second section, we will review the conceptual literature regarding emerging Territorial Innovation System. In the next section, the research methodology will be discussed. The last section concludes the paper by presenting the detailed results of the empirical study and concluding remarks.

2. Conceptual Literature review regarding Emerging Territorial Innovation System:

Over the last twenty years, Territorial Innovation System approaches have been played a key role in the economy of innovation and knowledge. They gave birth to a huge literature which is currently the subject of many synthetic and retrospective contributions (Moulaert, Sekia, 2003; Simmie, 2005; Lagendijk, 2006). In the recent economic and geographical literature, the phenomenon of local industrial clusters has attracted much attention. Under the headings of 'industrial districts'(Marshall, 1930), 'local industrial clusters', 'innovative milieu' (Aydalot, 1986) and 'national and regional innovative systems'(Edquist, 1997; Freeman, 1987; Lundvall, 1992; Nelson, 1993), learning region (Cooke, 1998; Morgan and Nauwelaers, 1998; Florida, 1995), the reasons why certain regions are successful while others are not have been extensively studied.

2.1. Cluster as a Territorial Innovation System:

Many empirical and theoretical works on Territorial Innovation Systems with clusters as an emblematic form of business organization has developed extremely important in recent years within various disciplines (economics, sociology, geography, management) forming what Malmberg and Maskell (2002) call "*spatial clustering theory*". The central idea in these works is that it is now the logic of spatial agglomeration, territorial anchoring and proximity of innovation actors that underpin the competitiveness dynamics of firms and territories in a context of rapid technological change, the globalization of industries and markets, and the increasing modularization of productive processes and innovation. According to Djeflat and Andrew (2015), based on a reasonably extensive literature search on regional innovation systems and other related concepts such as local or territorial systems of innovation, there is

almost no specific systematic conceptualization of how to understand the process by which these sub – national territorial systems of innovation come to be, i.e. emerge, and in general there is little theorization as to how to understand their evolutionary dynamics. We argue like Djeflat and Andrew (2015) that territorial innovation system emerging in the diverse territorial contexts of the developing South, such as Central America and the Maghreb countries in North Africa, have qualitatively different dynamics than the regional innovation systems that are of reference in the Regional Innovation System literature. It is only recently that several contributions have addressed the existing research gap on cluster emergence (Braunerhjelm and Feldman, 2006). According to Djeflat et Andrew (2015), there is a recognized need to analyze systems of innovation emerging or under construction in a diversity of national contexts in the BRICS and in general. Significantly less attention has been paid to analyzing territorialized – sub national – innovation dynamics and the emergence of different systemic organizational and institutional configurations to support innovation in these territorial contexts. We assume that the cluster is a form of territorial system. We are very interested in the construction, the formation and especially the emergence of this system on a territorial scale. Brenner and Muhlig (2007) consider three kinds of approaches dominate the literature about clusters emergence : case studies of regions identified as being economically successful (around 200 such studies are included in this meta-study), approaches generalising the findings in case studies in order to identify some of the causes why regions are successful (such approaches can, e.g., be found in Becattini 1990, Porter 1990, Scott 1992, Camagni 1995 and Markusen 1996), and approaches explaining the existence of local industrial clusters by mathematically modelling or simulating economies of location (Krugman 1991, Fujita & Thisse 2002, Maggioni 2002 and Brenner 2004). Our study is part of the case studies among the studies of the second approach. The above literature addresses the questions of why local industrial clusters exist, how they emerge and why they are successful in comparison to other locations. In the following section, we focus on the question of how local industrial clusters emerge. Although many of the case studies under review have addressed the question of how local clusters emerge, they have come to different conclusions. The case studies are conducted on the basis of different concepts and assumptions. It is therefore difficult to grasp a clear picture of what really causes the emergence of local industrial clusters. Before we study the emerging the biotech clusters, first, we propose to introduce the concept of emergence.

2.2. Conceptual Framework of Emergence: Literature Review

Emergence is simply the process of formation of new forms of existence of the real, which can be described as degrees of organization and integration. We use the notion of emergence when referring to the first stage of cluster development that is the evolution of firms and institutions until their number reaches the critical mass. Furthermore, emergence describes a broad continuum ranging from normal economic activities to the stage of firms becoming geographic concentrations of interconnected companies and institutions in a particular field (Porter, 1998, 1978). The emergence concept itself, introduced for the first time in the literature on National Innovation Systems in the south by Djeflat (2006), aims at better understand how system innovation emerges in “pre-catch-up” countries that are in a different stand and trajectories from “catch-up” countries. Many artefacts indicate in both Latin American and African countries are from the catch-up dynamics which characterize the BRICS. According to Djeflat

(2006), all North African Countries and notably the four main ones (Algeria, Tunisia, Morocco and Egypt) are experiencing a “falling behind” in their innovation systems, innovation output in terms of registered patents at USPTO are dismal, with serious problems of absorption of R&D funds. It seems the “emergence” paradigm to be more appropriate to characterize innovation system in neo-peripheral countries than the catch-up one. Djeflat et Andrew (2015) argue that territorial innovation system emerging in the diverse territorial contexts of the developing South, such as Central America and the Maghreb countries in NorthAfrica, have qualitatively different dynamics, than the regional innovation systems that are of reference in the RIS literature. In some Maghreb countries, like Morocco, the Ministry of Industry and of Commerce had initiated a new proactive strategy, the "Plan Emergence". Several measures have been adopted to support this strategy, of which we particularly mention the creation of zones and platforms dedicated industrial structures, with an attractive incentive framework as well as a la carte-training program for targeted support to news industrial branches invested by the Emergence plan. It's about offering Turnkey sites for outsourcing activities. Updating the Emergence Plan, the State and the private sector have sealed together The National Pact for Industrial Emergence in formalizing a program contract covering the period 2009-2015, mobilizing and coordinating the actions of the State and the operator economy. The contract program was designed around the basic idea that is to focus industrial recovery efforts on sectors where Morocco has competitive advantages (Amine, 2016, p105-106). The emergence and sustainability of a cluster and the evolutionary path it is susceptible to follow are eminently idiosyncratic (Hamdouch, 2011).Our conceptual and analytical framework is twofold: the study of forms of emergence and the determinants of this emergence.

3. Methodology:

The purpose of the empirical study is to analyses the development dynamics of a cluster in order to determine the determinant of emergence and the role played by public institutions in this growth process.

3.1. Research context:

For the choice of the methodological approach, we give priority during this research to the use of an exploratory analysis. Kaufmann (1996) points out that qualitative methods aim to understand, detect behaviors, processes or theoretical models that describe, measure or compare. First we did a preliminary exploration of gray literature (press article, websites, etc.) completed by a specialized literature (books, ministerial reports, documents internal Clusters).This choice is justified by the fact that during our investigative research on the development of the cluster, we found that it was under construction and few companies are located in the Techno Park. The qualitative study is more appropriate to the objective of our research. In terms of data collection, we triangulated multiplicity of data sources to enhance the validity of research: questionnaire, semi-structured and open-ended interview, documentary studies were our main method of data collection. The qualitative data used in this discussion were provided by key stakeholders involved in Sidi Abdallah’s biotech cluster projects such as SME managers, consultants, and ministerial officer.

3.2 Sample:

The selection of the studied companies was made from a list provided by the Ministry of Health which contains a total of 21 projects. According to an official in the Ministry of Health, the choice of companies was made on the basis of a call for tender launched and managed by the Ministry of Health. We obtained this list of firms constituting the future biotech cluster from the Ministry of Health, we found, after our visit on the site, we found that there are only four operational firms to which we have sent a questionnaire namely: *Abdi BRAHIM, El Kendi, Dar el Arabia, Ceva Laval1*. *The four companies located in the cluster were surveyed in their entirety. Al Dar El Arabia is a subsidiary of Hikma Pharma Algeria, a Jordanian pharmaceutical group. The Jordanian group, which already has two drug production units in Algeria, plans to build a third production plant and logistics warehouses for a total investment of 15 million dollars2. El kendi is a subsidiary of the Jordanian MS Pharma Group. CEVA Santé Animal is a French pharmaceutical company whose core business is the research, development, manufacture and distribution of veterinary products3.* Concerning the legal nature of firms, the most dominant legal form among the companies studied remains the SPA and EURL, with 50% for the former and 33.3% for the second. This informs us about the profile of companies that will set up on the site of the biotech park by 2025. For the development strategy, these two types could adapt to the mode of governance required by the current and future competitive environment. Only 16.7% of the companies observed are LLCs. This explains the growing number of local family businesses wishing to establish themselves in the cluster in order to benefit from the know-how of large multinational firms.

3.3. Research Structure:

To analyse the collected qualitative data, we have used the content analysis method. This step begins with selecting and extracting information that may answer our research questions. So, we first transcribed all the audio recordings and then after several readings, we coded the texts, cut into units of analysis (themes, words, phrases) regarding the information sought by the topics covered in the interview guide. Coding is defined as "*the process by which the raw data is processed systematically and aggregated in units that provide an accurate description of the relevant characteristics of the content*" (Holsti, 1969). The methodology of our research is organized into two phases. In the first phase (quantitative), a questionnaire was distributed to collect information on the localization and cooperation activities carried out by the various companies and institutions located in the cluster during the period going from May to June 2016. The second phase (qualitative) was carried out with three ministerial representatives

¹In this regard, it is noted that in most of qualitative studies, it is to select "the small samples that have no objective representation in the statistical sense, but that meet the criteria of relevance the structure of the studied population" (Evrard et al, 1997, p. 100).

²http://www.leconews.com/fr/actualites/nationale/industries/une-nouvelle-usine-pour-hikma-en-algerie-05-03-2014-167997_340.php.

³The group not only specialized in animal health but is involved in the fight against the spread of infectious diseases that can be transmitted to humans by wild or domestic animals and birds, diseases known as Zoonoses, including avian influenza, brucellosis, and Q. fever.

between November 2017 and January 2018 through an interview guide complementing the first stage. A series of interviews with experts was conducted to validate the information obtained.

4. Results:

Based on the literature review and the results of the qualitative survey, the purpose was to identify the key factors of the emergence of the biotechnology cluster. Information was gathered about history, institutional frame and resource composition of the cluster, its networking activities, and its general traits. We can deduce the key elements of the cluster emergence process, which we have adapted to the case of the Sidi Abdallah biotech cluster⁴: 1. Localization or geographical concentration (reasons for the choice of territory, proximity to other research centers and universities, quality of infrastructure); 2. Cooperation and inter-firm organization (intensity of relations, the evolution of the relationship, the involvement of public institutions in the clustering process, aid received, incubators, diaspora). 3. Life cycle cluster (creation date, the desire to relocate); 4. Cluster's critical mass. Open-ended questions led to more in-depth information on aid received and on actions - such as public programs - that could help the firm's development within the cluster. The descriptive data were first analyzed by SPSS to determine the general structure of the cluster. In a second step, we looked at how some of these characteristics influenced the emergence of this cluster.

4.1. Localization of Firms inside the Cluster:

Our case study shows that the process of emergence and development of the biotech cluster was organized and was directly supported by public institutions in the framework of SNAT 2025. The question about the location and the attractiveness of the cluster, the majority of companies seem to be motivated by the cluster implementation initiative (Ferdj, Hamadi 2017). This demonstrates the interest shown by these companies in the importance of the territorial attractiveness dimension for their development. Whether on the side of the public decision-makers as on the sides of the companies interviewed, all consider that this new cluster constitutes a new pole of specialization. Several aspects of localization in Sidi Abdallah biotech cluster are discussed in this section.

4.2. Facilities from public authorities:

According to the responses of the companies already installed, it can be said that half of the companies did not find administrative difficulties during the implementation of the Biotch cluster. The results of the survey clearly show that only the foreign companies have started to produce and this is due to the facilitation of the implementation. With regard to transport infrastructures, the respondents declared themselves moderately satisfied of the quality of the motorways but dissatisfied with the other means of transport. The efforts of the public

⁴On Tuesday, August 07, 2012, the start was officially launched by the Minister of Health, Population and Hospital Reform, Dr. Djamel Ould Abbès accompanied by the Dean of the Faculty of Medicine at Harvard University Dr. William Chin Waiman, also laid the foundation stone for the Biotechnology Engineering Center. As the majority of interviews point out, the objectives set by the creation of the cluster tend to create, on the one hand, dynamics of territorial innovation based on research and development involving different actors, and on the other hand, to identify and master manufacturing and production techniques in the field of technologies (biotechnology, electronics, high tech).

authorities provided in the latest development plans along the lines of the East-West motorway contributed to the opening up of the New City of Sidi-Abdellah. According to the survey results on government support, 83.33% say they have not been supported. The interviews show that each department finances the organizations that are attached to it. We note the lack of dynamism on the part of venture capital institutions in favour of start-ups. A rather paradoxical situation, knowing that direct or indirect public support is a fundamental condition in the attractiveness of a territory, but also in its development and competitive strategic capacity (Djefflat 2013).

4.3. Trigger factors to invest in the cluster:

The decision to install in the cluster is motivated by three main reasons: the tax base, the structure of the biotech cluster and logistics, with 33.33%. Among the factors driving investment in biotechnology, first of all, we found the existence of business partners (special distributions) is at the top of the list, with 50% of the total, followed by access to technology (license and patent) in the second position with 20% (see table 1). Secondly, the choice of territory is mainly motivated by the availability of land bases in degrees (18%), as well as the tax advantage (18%). Also, the proximity of the Biotech Cluster to the research and academic centres is considered satisfactory. According to the results of the survey, it can be noted that the bio-pharma research institutions are located relatively far from the Cluster, such as the universities of Blida and the University of Science and Technology Houari Boumediene (USTHB) which accommodate each of the departments of biotechnology engineering. The reasons for the installation at Sidi-Abdallah's Biotech cluster, the presence of other institutions, account for half of the companies surveyed. This expresses the need for companies to seek a form of clustering. The intention to relocate into another pole other than that Sidi-Abdallah, the majority of the companies surveyed who are located in the cluster, with more than 66%, did not intend to relocate to another cluster because of the facilities available on the site and the proximity to the capital (Algiers), the airport (30 KM) and the port (37 KM). These results confirm the previous result that companies are looking for a form of cooperation with major companies such as the leader *SAIDAL* (local public company) and the large French company *Sanofi-Aventis*. The latter took the decision to set up on the site in June 2017, according to the statement of its general manager in Algiers. On the other hand, the level of security within the cluster is considered very satisfactory mainly for foreign companies. This represents a strategic asset for this cluster by making it more attractive in the future. Geographical proximity is necessary to reap the benefits of geographic agglomeration, but it is not sufficient. Cognitive, social and cultural proximity is also necessary for collective learning. This will be discussed in the next section.

4.4. Cooperation Inter-Firm Organization:

The traditional literature on clusters highlights the importance of collective understanding among stakeholders of the benefits of business-to-business cooperation, for example in resource management and the opportunity to improve methods of integrating the value chain (Andersson, 2004). The firm will actively participate in cluster activities to identify issues of mutual interest and opportunities for mutual gain (Porter, 2001). While proximity is important for formal and informal flows of knowledge, global linkages are equally essential. In many

cases, multinational enterprises have transferred skills and technologies that have played a decisive role in the development of local clusters (Dunning, 2000b). In this section, we discuss the characteristics of the inter-firm organization based on the results of the empirical study in three points in relation to the mergence dynamics. Interviews with officials from different ministries and the installed firms revealed many key points in relation to the inter-firm organization. For public authorities, the goal of cluster creation is to participate to the development of scientific research R&D in the field of biotechnology (Hamadi, Ferdj, et Datoussaid ; 2020).

4.4.1. Cooperation inside the cluster:

The study reveals three important points in relation to the creation of the cluster: the established companies wish to develop partnership with other firms; expand their activity, search for other opportunities. Most of companies have maintained relationships and partnerships with other foreign firms 33% or local, or both at the same time more than 50%. The majority of companies surveyed on relations with research and training institutions claim to have relations with training centers in first place with 23% followed by public research centers, international research centers and universities with 18%. Partnership encouragement is more necessary than ever, either with foreign or local partners. We note that universities and specialized institutes that represent an essential engine for the development of clusters and their support are relatively far from the park.

4.4.2. Cooperation outside the cluster:

The availability of contact with the Algerian diaspora, the results show that the majority of respondents say they do not have contact with the Algerian diaspora (83.33%). On the other hand, the results show that all firms work with foreign experts and consultants according to the following table. This result shows the need to collaborate with foreigners on technology transfer and R & D. The common idea is the search for geographic and organizational proximity. For the availability of inter-firm means of communication, we find that Internet comes in first place. According to our survey, this means that access to internet on the site of Sidi Abdallah is assured. More than 40% of companies have used this medium, followed by the second-best phone. Knowing that the telephone is a technology that allows actors to communicate with internal and external partners, even using fax and the Internet, its poor availability constitutes a brake to the development of the actors in place (Djeflat, 2013). And finally, we find the mean face to face with 20% which explains the proximity of the firms located on the pole of Sidi Abdallah. This means of communication is considered important in order to consolidate and strengthen collaboration and coordination between all the companies and actors in the same territory.

4.5. Cluster Life Cycle: Slow but Long-sighted:

Since this is an organized cluster -top-down logic-, the process of emergence of the biotech cluster strongly depends on the process of realization of SNAT 2025. This raises the question of the life cycle of the cluster. The idea of a life cycle and stage of development within a cluster rejects the traditional approach of clusters deemed too static and unable to account for their dynamics of evolution and structuring (Swann 1998; Pandit et al., 2002; Feser and Luger, 2003;

Brenner, 2004). A set of works (Rosenfeld, 2003; Swann, 1998) thus distinguish four phases of development which are themselves a function of the processes of emergence, diffusion, commercialization and decline of a technology and the development cycle of (1) embryonic clusters (initial stages of development); (2) established clusters for which there are still growth prospects (emerging); (3) mature clusters (difficulties to grow); And (4) clusters in decline. In the initial phase, material needs (financial, infrastructure, prospecting and market evaluation) seem to predominate (Favoreu et al., 2008, p171). In the initial stages (emergence and development phase of clusters) and due to the emerging nature of technologies and markets, the intervention should focus on facilitating access to infrastructure and venture capital financing (Bianchi et al., 1996). We can conclude that, in the present state, it is in an embryonic phase. It is an initiative of the State to create poles of excellence according to the SNAT (National Scheme of Territorial Development). The emergence of the cluster is dependent on the evolution of works of the new city of Sidi Abdallah. SNAT 2025 is implemented in two phases. A first phase 2007-2015: during which the spatial planning policy will remain during this period mainly marked by the voluntary action of the State. The existence of a life cycle of clusters and differentiated needs arise from the assumption that policies and interventions vary over time and have to adapt to changing needs and characteristics of the cluster (Dalum and Al., 2005). According to an Algerian expert involved in the project to realize technological parks in Algeria, considers that there is a heavy establishment of a pharmaceutical and biotechnological center that constitutes an economic lever for the region or the whole country offering to the national and foreign investors the possibility of developing their projects on a site *"the failure is due to the slowness of the various Algerian players involved in the process, the project being multisectoral. According to him, the Algerians took a long time to set up an interministerial committee. For their part, the Americans had to set up the roadmap to be proposed to the Algerian side"*. Interviews with representatives of ministries of health, higher education and a representative of the ANPT⁵ (National Agency for the Promotion and Development of Technological Parks) reflect not only a slowness of these actors but also a lack of definitions of the missions of each one.

4.6. Insufficient Cluster Critical Mass:

For a cluster to achieve internal dynamism, it must mobilize many actors and reach a kind of critical mass. The presence of critical mass can perpetuate industrial restructuring in a cluster. On the other hand, critical mass can serve as a "buffer" and make a cluster resistant to exogenous shocks or other types of pressures including business "losses", even when they could be considered "key companies", both that a critical threshold of the remaining actors the (Andersson, 2004, p28). In our case, the installation of domestic producers such as the SAIDAL group is planned soon, according to officials at the Ministry of Health and a representative of SAIDAL⁶ this installation is subject to the state of advancement and development of the cluster,

⁵ The National Agency for the Promotion and Development of Technological Parks (ANPT) was created by Executive Decree No. 04-91 of 24 March 2004. It is an industrial and commercial institution (EPIC) under the supervision of the Ministry of Post and Information and Communication Technologies (MPTIC), its headquarters is in the Cyberpark of Sidi Abdallah.

⁶ Mr. Hamouche announced other projects in prospect, including an anti-cancer drug production unit in the news of Sidi Abdallah as well as a research and development centre will be carried out in the new city of Sidi Abdallah.

that is to say, the cluster must reach critical mass with a sufficient number of installed and operational enterprises. The ministry of Higher Education and Scientific Research will intervene later when all the private companies are installed and will have begun to produce. From then on, the construction of research centres and research institutes specialized in biotechnology will be undertaken under the supervision of the Ministry of Health and the Ministry of Higher Education through the National Fund for Research (FNR). Support for entrepreneurial processes takes the form of financial aid (ANDI investment funds⁷), subsidies and specialized infrastructure such as incubators; on the other hand, our empirical study highlights significant weaknesses in public policy in terms of support and assistance to companies, which are reflected in the absence of incubators in biotech. Regarding the availability of hosting by an incubator in the biotech clusters, the results show a total absence of incubators; this demonstrates all the more that this new cluster is currently under construction. In this way, the cluster will be brought closer to international standards in terms of innovation and research. The absence of critical mass can inversely make a territory vulnerable to the loss of specific resources and skills that are essential to the development of a cluster (Asheim et al., 2003). We can conclude that to date the critical mass in the Sidi Abdallah cluster has not yet been reached.

5. Conclusion

Our research's results contribute to the territorial dynamics of emerging cluster literature in two different points. Firstly, this study also represents one of the very few empirical studies conducted in biotech cluster in Algeria and as such may offer some insights on the importance of the territorial dynamics in the field of biotechnology in developing countries. Algeria's transition to the market economy also implies a transition to the knowledge-based economy, where strategic territories become the engine. Secondly, our study contributes to the understanding of the emergence of the biotech park in Algeria which is in a phase that we call "*peripheral cluster emergence*". At this stage, cluster policy is often ineffective in peripheral regions with weak institutions, lack of coordination between the different actors involved in the project and significant barriers to knowledge production and exchange (Calignano et al., 2018). This concept of emergence of peripheral cluster is analyzed through the conceptual framework: form of emergence and main determinants. Our results will be analyzed through this conceptual framework.

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⁷ National Agency for the Development of Investment are the missions are: Financing of the projects of the young promoters by taking shares in the capital of their SMEs; Facilitate the access of under-capitalized SMEs to bank credit by improving their financial structure.

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