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BUSINESS MODELS IN THE BIOTECHNOLOGY SECTOR.
AN APPROACH TO THE DEVELOPMENT OF CLUSTERS

In this document, there is a need to approach the biotechnology sector and the cluster structure as a regional development strategy. For this, a documentary investigation of this phenomenon and the analysis of the integrated and explained variables was carried out. Also, the implications for the regional development of the strategy of implementing a cluster of biotechnology, and studies on issues such as competitiveness, regional development, innovation and clusters, the methodology used is documentary. In this context, it is established that the intangible value of patents and processes derived from the study of this industrial sector have generated important regions in the global scope that present a high level of income and high quality of life for the inhabitants in the countries that have propitiated development of this sector. It is for this reason as a fundamental part of the study the creation of clusters of biotechnology is proposed that take advantage of the conjuncture between the industry, the academy and the public sector, with the purpose of generating a social synergy in regional context.

Keywords: cluster, biotechnology, business-model.

Research on business model innovation for the biotechnology industries remains an element of high global interest. This is due to the combination of the innovation challenges of this industry based on knowledge and the global macroeconomic pressures that at every moment observe a wide possibility of exploiting the intangible capital created from research in this sector, but which have had a limited exploitation in areas of innovation implementation [1].

In line with the systematic search and literature review of scientific products that have addressed relevant factors and dynamics of the business model in companies in the biotechnology industry, it is observed that the opportunities for innovation of business models in this sector are found in five key areas: 1. External Orientation; 2. Learning Capabilities; 3. Participation in Clusters; 4. Qualified Business Management Team; And 5. Organization Controls [1]. Under these schemes, it is feasible to determine that a society evolves from a fundamentally economic perspective according to the process: from the production of raw material to manufacturing; diversification of products; and finally, to the development of technology and the generation of own knowledge.

The reproduction and distribution of the intangible value that is subject to the intrinsic creation of patents on processes of production, are fundamental part in this evolutionary change that sustains the means of growth of the social group. In this area, the relevant aspects of science applied to the resolution of social and scientific problems seek to integrate business models that are adequate to increase an optimum benefit to all social agents that are affected by policies and strategies sustained in the sector of biotechnology.

According to Porter [2], a conglomeration of companies that are located in a geographic zone can generate associations and interconnections in a specific area or sector of the economy, linking their strengths to take advantage of business opportunities in the global environment without the need to remain in constant training to develop skills that other companies already have.

The generation of sectoral groups becomes a laudable policy for regional economic development. A growing interest in the emergence of high added value products, which usually come from a vast scientific research activity, leads to the development of products or the innovation of those already existing. Clusters, so-called these grouping, are part of the actions that have been developed in multiple locations around the world to develop a geographic area by claiming that their capabilities and abilities as a region are strong enough to prevail in the selected sector over other areas in Other parts of the world. Such is the case of the wine cluster in Baja California, the software cluster in Guadalajara and Monterrey, among others.

In addition, modern biotechnology can fulfill different roles in the productive process [3]. Sometimes it can be a core technology, that is, it fulfills a key function or it can be a supporting technology [4]. In its development and application are observed socioeconomic and environmental impacts [5]. The economic effect can arise from the emergence of new business environments to a change in the productive structure of a region and even a country and bring about an improvement in its international competitiveness [3]. Therefore, biotechnology as any innovation can generate incremental, disruptive and even radical effects; The latter being infrequent and difficult to predict. Undoubtedly, each of these effects imply a challenge for the definition of public policies in the medium and long term.

Feldman and Audretsh [6], developed a theory of economic development based on the establishment of innovation clusters. This means that knowledge is an integral part of the emergence of these sectoral groupings, therefore, an efficient articulation between industry and universities, research centers, institutes and other concentrators of highly specialized human capital must be carried out. In his research, Bykova [6] includes an analysis of the importance of these knowledge-generating organisms and their effects on cluster formation. These actions become more relevant when the cluster industry requires high-level human, structural and relational capital, such as information technology, biotechnology, nanotechnology, aerospace, and other areas of science and technology [7].

In recent years, biotechnology has been responsible for the commercialization of various products, such as enzymes, amino acids, drugs and foods. However, in spite of having in his antecedents a great amount of example of success, it continues playing a minor role in the chemical industry. Its role is outlined in areas where petrochemicals can not enter successfully, as in enzymes. Support for this trend is essential for regional competitiveness in some parts of the world, as in Europe [5], and in the same way, it has played a relevant role in establishing strategies that enhance the development of innovation processes [8].

The cluster concept is a way of analyzing national, regional and local economies. It reveals new functions and relationships for companies, public authorities and other institutions that are striving to improve competitiveness [2]. The presence of clusters means that much of the competitive advantage lies outside the company, even outside the sector: in the locations of its business units. An example of the importance of regions as a factor of competitiveness is exemplified by the statement that an international investment fund management company is much more likely to succeed in cities like Boston than anywhere else in the USA. The same is true of high-performance car companies in Germany [2], as well as biotechnology companies in some Eastern European countries, such as Estonia, where two This development: on the one hand, specialization and fragmentation, and on the other, the institutional and geographical convergence of the agents involved [3].

An important activity in the cluster concept is the identification of its existence. That is, to determine that the conditions are present and developed in an undetermined or detected way, so that, from this, the public policies that allow the establishment of a business conglomerate in form are established. For these actions methodologies have already been determined to carry out adequate analyzes [9]. One of the measures studied by these researchers is that of spatial concentration and that of integrating information about the spatial interdependence of the industrial structure of the cluster that contributes to the identification of an adequate frame of reference. In addition to performing the study of networks that are specifically articulated to give way to the business and industrial environment suitable for cluster formation, which have an adequate dynamics and establish the benefits that will be obtained in this business symbiosis [10].

By their very nature clusters are geographical concentrations of interconnected enterprises, specialized suppliers, service providers, related sector companies and related institutions (eg universities, standards institutes, trade associations) which compete but also cooperate. As critical masses of unusual competitive success in particular areas of activity, clusters are a striking feature of various national, regional and local economies, especially those in the most economically advanced countries. By its geographic dimension, a cluster can be local, regional, national or international [2].

Business models There are a lot of similar definitions from different perspectives of what a business model is and how it conforms [11]. Despite the existence of a varied conceptualization of the construct, an incremental consensus is presented in which the concept offers an integral description of how companies generate, obtain and deliver in a sustained manner, value through interaction with their environment [12].

It is for this reason that the definition provided by Berglund and Sandström [13] defines a business model as: "a high-level description of how a company (or part of a company) creates, delivers and appropriates value, Which focuses on a focal company, but also transcends the limits of the company" is considered as integrating the generic concept. Business models are multidisciplinary and involve subjective factors and characteristics that predetermine a valid complexity in the variety of contexts where they are implemented, that is why there is no single operational definition. What does exist is a series of issues in which both researchers and entrepreneurs agree on business models:

- A business model describes how a company, or business unit creates, delivers and captures value [14].
- It is common to define a business model in terms of its set of components and their interrelationships. For example, value proposition, market segment, key partners, income model, etc. [13].
- There is a consensus that a business model transcends the boundaries of the business [15].

There are three models generally used by biotechnology companies. The model based on the product; The model based on technology and platform; And the hybrid model, which considers both areas for the generation of a value proposition that involves the development of the organization. It is important to mention that the implications in the positioning of the companies of this sector are based to a great extent on the proper use of the business model [11]. Mentions of the different business models indicate a diversity in the approach to the generation of value in these companies.

The research is based on multiple sources of information to draw conclusions on the use of indicator systems for regional development policy. It is certainly based on relevant literature on performance evaluation, indicator systems, and regional development policy management in different representative locations of this economic sector. However, there are relatively few studies on the specific use of indicator systems in the context of the formalization of directives to form a cluster of innovation in biotechnology of regional development policy, where collaboration occurs through different levels of government.

As the economy increasingly becomes more global and with a livelihood of intensive knowledge, firms, regions and countries become increasingly dependent on it [16]. That is why the adequate development of the potential of science is directly associated with universities, companies and the public sector. This in turn makes it necessary to implement public policies that support the formation of industrial conglomerates or clusters [17]. These actions will bring together both the companies that are part of the sector and the universities that must adapt to the particular regional environment of each zone to have greater effectiveness in their role within the intensive knowledge system, that helps the development of the sector in each geographical area, taking into account their cultural, spatial, population and socio-political conditions [2].

Cluster development is directly associated with knowledge management, R & D capabilities and the skills of the population of a specific region [18]. Innovation processes in turn generate the creation of clusters and these generate innovation processes, it becomes a virtuous cyclical process. Also, studies have been carried out from the perspective of regional identity as a relevant factor for the implementation of policies that consolidate the formation and consolidation of clusters [16].

The benefits of targeting an economic sector or industry in an adjacent geographic region have been extensively studied and discussed by multiple researchers and entrepreneurs. Several researchers have tried to concentrate the conditions of their emergence on economic development as part of the globalization phenomenon prevailing in the modern world [2].

Innovation and knowledge are presented as the main goals for the development of public policies that are supported by the capacities and vocations existing in diverse regions [19]. In order to have a positive effect on the implementation of these social growth policies, other issues that affect the empowerment of the environment must be taken into account as a focal area of resources, people, processes and governmental tendencies for the establishment of a region Highly competitive, articulating activities, intentions and actions of the actors in a common axis oriented to regional development [16].

However, not everything is established from the governmental perspective. The social environment, the development of human capital and sectorial groupings are fundamental part in the strengthening of the sectors that have their incidence in the growth of a region oriented to the strengthening of an economic sector and infrastructure [20]. These perspectives as well as holistic, must have a systems perspective, since it is not only the type of industry that matters, but also the networks of collaboration that arise from its formulation.

The biotechnology sector can quickly become a source of income for intangible products; however, for this to be achieved in an adequate and functional way in the short term, public and private financing is needed, as well as the generation of public policies that drive the development of the sector. In addition, consideration should be given to the generation of medium- and long-term strategies to make biotechnology a sustainable sector. The development of a region should consider important factors:

- Generation of value through products derived from processes of the biotechnology industry.
- Establishment of public and private policies and procedures to encourage and encourage the development of the sector.
- The promotion of funding sources to support the emergence of new companies.
- Develop a strong academic-business-government link.
- Develop new high-level human capital for the growing needs of biotechnology-based companies.
- Establishment of organizations to assist the development of a cluster.

These are some of the strategies that will help to develop and consolidate a cluster of biotechnology that can emulate the results of the clusters in Europe.

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