

## **Conditioning factors for success in the formation of agtechs in innovation environment in Ibero-American countries**

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The development of startups is dependent on innovation environments that positively condition them in establishing their businesses through mentoring, networking, fundraising systems and product validation laboratories (Baptiston, 2021). According to the author, they can be within universities with the necessary approximation of researchers or in the private sector, with the participation of leading companies that practice open innovation.

In the latter, in Brazil, there was a significant emergence of startups or small innovative companies that have a repeatable and scalable business model (Figure 1), stimulated by the motivation to explore knowledge as the basis of their competitive strategies (Varrichio, 2016).

Agribusiness startups, called Agtechs, seek to generate environmental, social and economic value for different segments of this sector, developing innovative technologies that, in a proven way, provide improvements in sustainability actions and, consequently, increase productivity and efficiency. in the use of resources (Silva, 2018).

Such innovation environments are defined as places conducive to the development of technological innovations (Chais, 2019) operating as means of community learning,

exchange of knowledge and, above all, relationships between actors present in the ecosystem, such as companies, educational institutions and government (Luz et al., 2014). They can be research centers or science and technology parks that have distinct characteristics and forms of independent exploration (Metcalf, 2010); as well as business incubators and accelerators, or venture capital firms (Etzkowitz; Dzisah, 2008).

Therefore, this environment and the actors that work in it need synergy and be focused on the needs and demands of the market, as well as understanding the role of each representative actor for the beneficial interrelationship in the innovation environment.

However, the set of innovation environments located spatially or geographically close is called the Innovation Ecosystem. Moore (1996) already envisioned the term “ecosystem”, referring to the ecological concept, where all organisms that interact and play their roles must remain in balance. This balance must be maintained within an innovation ecosystem, where different actors play an important role in the creation of innovative ventures. They are still considered dynamic and bring together the action of various stakeholders that encourage and cooperate in the co-creation of new companies (Maleki, 2018).

The role of actors that interact in innovation environments/ecosystems is to foster technological development, which in turn generates greater economic development and the provision of sustainable products and services (Frenkel; Maital, 2014).

That said, this work identified good practices of incubation within innovation environments of Ibero-American countries (Argentina; Brazil; Chile; Colombia; Spain; and Portugal) that condition the success in the formation of agtechs.

In order to carry out the collection of information necessary for the current work, a strategy was set up to use the lectures held at the International Online Forum on Entrepreneurship and Innovation in Agri-food (FINOVAGRO 2020). FINOVAGRO took place in December 2020 and was co-organized by the Government of the State of Paraná, of the Virtual University of Paraná (UVPR) and by the “Commission on Animal Science of the Regional Council of Veterinary Medicine of the State of São Paulo” (CRMV-SP).

The event was organized by the Center for Innovation, Entrepreneurship and University Extension (UNICETEX), a didactic laboratory in business management and

entrepreneurship in agribusiness of the Department of Biosystems Engineering (ZEB) of the Faculty of Animal Science and Food Engineering (FZEA) of the University of Sao Paulo (USP); the Professional Master's Program in Management and Innovation in the Animal Industry (PPG-GIIA), from the same unit and the Ibero-American Network of Incubators, Science-Technological Parks, Accelerators and Innovation Hubs in the Agrifood System (Agroinncuba Network).

The opportunity was also taken to collect data at the “4th World Meeting of the Agroinncuba Network”, Ibero-American network of incubators in the agri-food sector. The network emerged in 2017, formed by PCTs, incubators, universities, research centers, researchers, accelerators, this network is focused on supporting innovative startups that operate in the agri-food sector.

Both events addressed the theme of “Innovation Ecosystems and Innovative Entrepreneurship Cases in Agribusiness” and had the participation of researchers and managers from universities, research centers, incubators and technology parks from some countries in the Ibero-American region, as well as professionals and entrepreneurs who work in the agribusiness innovation ecosystem.

The selected cases were intentionally chosen because they present different forms of management and performance, degrees of maturity, a wide degree of complexity of action and peculiarities that can be valuable for the generation of data for the research. Thus, the following cases were selected for analysis:

- Argentina: Business Biotechnology Acceleration System for Rosario and Its Region, **SABERR**;
- Brazil: Technological Incubator of the Higher School of Agriculture “Luiz de Queiróz”/USP, “**ESALQTec**”, located in the municipality of Piracicaba/SP;
- Chile: Business Incubator of the Universidad de La Frontera, **INCUBATEC**
- Colombia: State-Enterprise University Committee (**CUEE**), University of Antioquia (Medellin/Colombia);
- Spain: Science Park of the University of Valencia (**PCUV**);
- Portugal: Science and Technology Park of the University of Porto (**UPTEC**).

All the countries studied are part of the AGROINNCUBA Network, an entity that seeks to support innovation ecosystems to create synergies and collaborative activities

among them, in order to improve their performance through information sharing and develop new joint projects.

The lectures given by the leaders of the selected innovation environments were recorded (video) for transcription and analysis. According to Graham (2008), the transcription of qualitative data involves precision, fidelity and interpretation of the content that was collected from the people who participated in a particular study, which is also necessary, according to Schiavini et al. (2018), that this procedure is carried out with due ethical care and attention, in order to avoid errors.

Regarding the data analysis, after the description of the lectures, in order to understand and compare the qualitative data that were exposed by each leader of the respective innovation environments, an analytical analysis of the data that was obtained was applied.

The research results showed that innovation environments were catalysts for Agtechs that produced knowledge and technologies aimed, initially, at the regions where they were located.

The formation of innovative companies in the agri-food sector, also called agtechs, startups and spin-offs are dependent on favorable environments that can condition good results for these nascent companies. In these innovation environments (science and technology parks, science parks, incubators, accelerators), there are different actors and wide interaction between them, where knowledge becomes the main capital for the generation of successful companies.

In these places, there are spaces for co-creation between people, development of ideas, identification of pains that need resolution, development of innovative technologies and products through capitalization of knowledge, transmission and subsequent transfer of technology to companies.

Figure. Factors that may affect the success of startups in the agri-food sector

SABERR	ESALQTEC	INCUBATEC UFRO	CUEE	PCUV	UPTEC
<ul style="list-style-type: none"><li>•Supporting multilateral funds</li><li>•Formation of disruptive projects</li><li>•Validation of business plans</li></ul>	<ul style="list-style-type: none"><li>•Research partnership with university</li><li>• Business opportunities with large companies</li><li>•Economic subsidy and financing mechanisms</li><li>•Partnerships with public bodies</li></ul>	<ul style="list-style-type: none"><li>•Increase in productivity and product differentiation</li><li>•International partnerships for export</li><li>•Economic subsidy mechanisms</li></ul>	<ul style="list-style-type: none"><li>•Entrepreneurial culture</li><li>•Research partnership with university</li><li>•Partnership with public bodies</li><li>•Social R&amp;D</li></ul>	<ul style="list-style-type: none"><li>•Support infrastructure</li><li>•Knowledge transfer</li><li>•Research partnership with university</li><li>•Partnerships with public bodies</li><li>•Convergence of interests</li></ul>	<ul style="list-style-type: none"><li>•Network activities</li><li>• Entrepreneurial culture</li><li>•Agglomeration of companies in the surroundings of the Park</li><li>•Business opportunities with large companies</li></ul>

Through the present study, it was found that there are key activities that generate the development of innovation environments and innovative companies that will be solid in the market. These are:

- a) the promotion of the creation of these innovative hubs through public policies;
- b) the partnership between companies, Universities and the State, where the demands and needs of the community around the innovation environments are verified, with joint action between all these three strategic partners, which make up the triple-helix model, and in fact occurs innovation through the interaction between these actors
- c) entrepreneurial training, since many of the innovation environments that were studied employ, in their initial or pre-incubation phases, a dense training for future entrepreneurs, researchers and/or leaders who seek incubation;
- d) partnerships with universities, which carry out sophisticated technological research and transfer of knowledge in the area of management to entrepreneurs.

There is no doubt that these innovative environments provide the solid creation of successful companies, but for that, it is necessary to have: promotion for the creation of innovation environments; entrepreneurial training with academics; skills that generate a complete transformation in the way of thinking of entrepreneurs; networking, laboratories and development centers, which in turn may or may not be financed by government resources.

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