



# **Promoting Sustainable Agri-food Systems through the Development of Agtech Ecosystems**





*"We recognize that in the post-COVID-19 Pandemic the critical challenges to the sustainability of agri-food systems have increased and many of them no longer live up to the goals of the 2030 Agenda for Sustainable Development. In this context, we emphasize that overcoming the fragilities of contemporary agri-food systems requires the creation and development of strong and consolidated AgTech ecosystems capable of addressing the pressing challenges posed by the triple planetary crises of climate change, nature loss and pollution through innovation, digitization and the development and greater uptake of new technologies"*

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### **Timeline**

The following document has been prepared between August and November 2021, in the framework of the [Sustainable Agtech Challenge](#). This project represents a call to action for all those who wish to contribute to the development of sustainable and resilient agri-food systems, capable of meeting global challenges, through the development of innovation and the promotion of agrotechnology.

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## Introduction



# Introduction

## Purpose and scope of the document

The following document has been prepared with the aim of promoting and communicating the central role of AgTech ecosystems in contributing to the growth and expansion of the sustainable agri-food industry. We are living in a time of disruptive global changes and challenges, being one of them the problem of achieving food security for a growing world population while promoting environmental sustainability.

On the road to achieving this objective, the development and promotion of sustainable agri-food systems is an urgent goal. It is in the face of this challenge that the AgTech sector has a fundamental role, due to its enormous potential to reshape agri-food value chains, creating regenerative, sustainable and inclusive systems.

## Key concepts

**Megatrends:** *Megatrends are the driving forces that define the world today and that of tomorrow. In other words, they are what we anticipate in the future. Megatrends are characterised by being far-reaching, global patterns related to behaviour, mobility and environment.*

**Agricultural food systems:** *encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal and natural environments in which they are embedded.*

**Sustainable agri-food systems:** *According to FAO definition(1), a sustainable food system is a food system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised.*

**Food security:** *"Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life". (World Food Summit, 1996).*



## Target audience

We have prepared this document for dissemination to international and public sector organizations, SMEs, development agencies, investors and other stakeholders interested in promoting sustainable agri-food systems by supporting entrepreneurs and startups that, through their innovative talent, and thanks to the contention of the AgTech ecosystems where they are located, show the potential to develop innovative and disruptive solutions capable of responding to the challenges faced by the aforementioned triple planetary crisis.

## Key concepts

**Agriculture 4.0:** *This term refers to the next big trends facing agribusiness and agriculture, including an increased focus on precision agriculture, the internet of things (IoT) and the use of big data to drive greater business efficiency in the face of population growth and climate change.*

**AgTech:** *"Array of technological innovations seeking to find solutions to the problems and challenges faced by the agriculture and food industry, is established as a relevant area for startups with the potential to not only create innovations, but to also generate transformative changes in the way of producing food with a positive impact on environmental, social and economic aspects" (2) (IDB 2019).*

**Talent for innovation:** *Can be considered as the capacity of people to understand and intelligently approach innovation processes through the development of their own skills, abilities and capabilities.*





# **The Future of Agrifood Industry: Trends and Challenges**



# The Future of Agrifood Industry: Trends and Challenges

## Towards the development of a sustainable agri-food industry

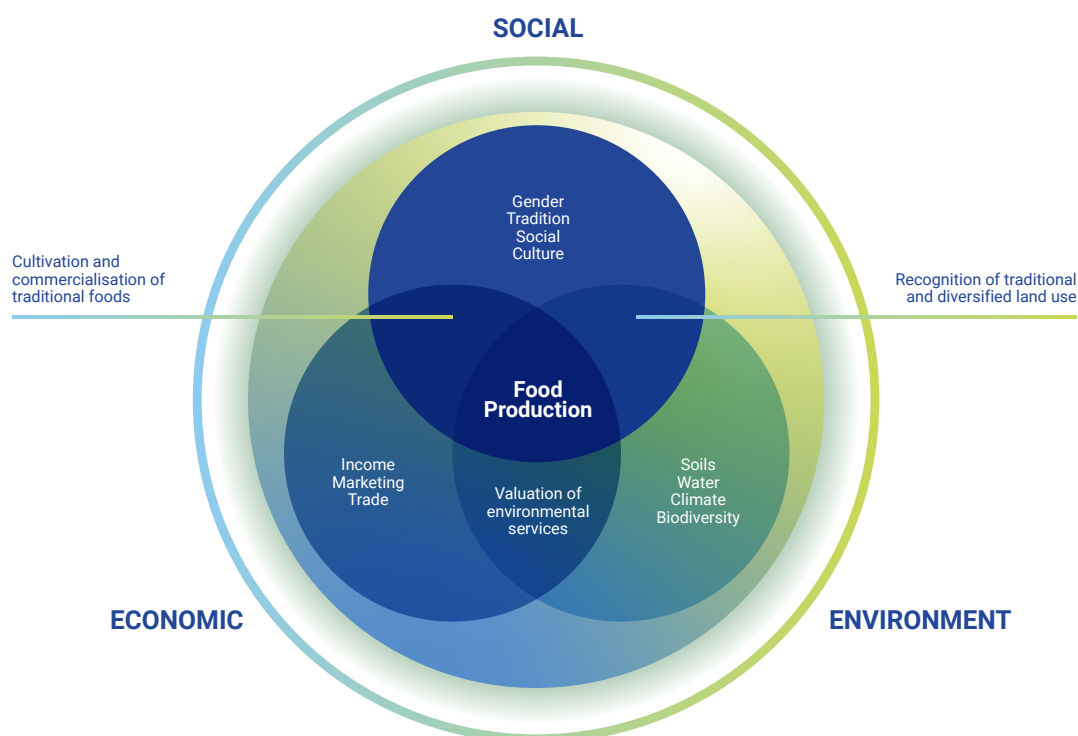
The world is immersed in profound changes that challenge the possibility of meeting the goals set by the global community through the Sustainable Development Goals (SDGs). Global megatrends such as the increase in world population, changes in consumption patterns, the adoption of new technologies linked to agri-food production and, of course, climate change, are challenging the agri-food industry and it is essential to respond with effective strategies.

While the agroindustry is an essential sector for the economic progress of many countries (especially developing countries)(3), we cannot overlook the fact that in recent decades,

agri-food systems have forgotten the multifunctionality of agriculture and have turned to the paradigm of producing more food at lower cost, using fertilizers, pesticides, energy, land and water irresponsibly; a model that has led to a vicious circle and has brought into play the clearing of land, the loss of biodiversity and, underneath all of this, a negative impact on the environment and climate change, unsustainable issues for the future (4).

As a result, agroindustry must now face a series of megatrends that challenge it to increase food production while respecting a balanced relationship between environment and population(5):

### MULTI-FUNCTIONALITY OF AGRICULTURE



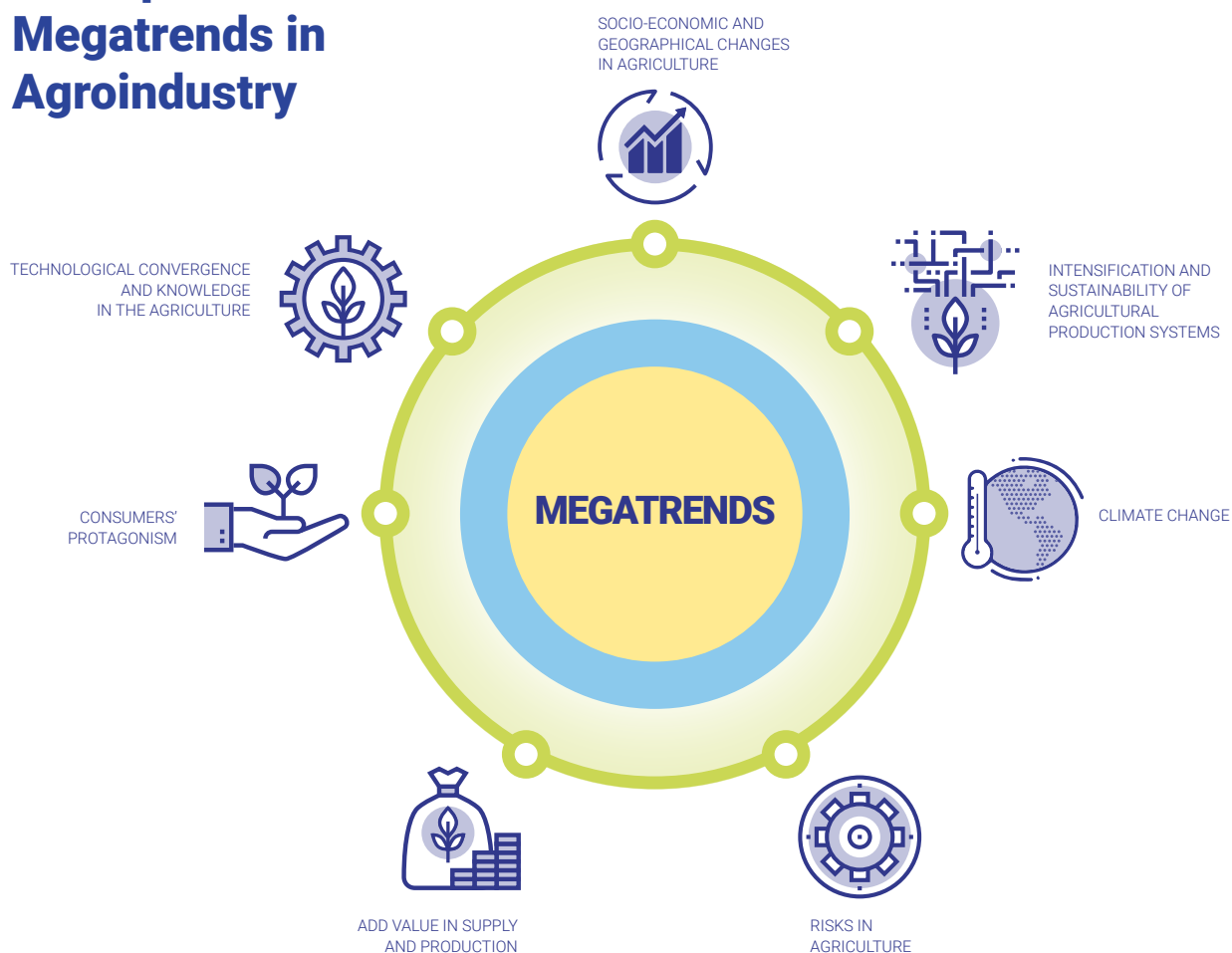
Source: IAASTD 2009  
Elaboration and graphic reinterpretation by TYLI



This context reveals the urgent need to promote sustainable forms of production and consumption. But achieving this goal will require a paradigm shift and that all actors involved with the agri-food industry work in alignment to achieve this objective, which will demand significant technological development, progress in innovation and, above all, talent or human capital capable of driving these changes.

For all these reasons, we point out that the change that will allow us to face the global megatrends can only be genuinely generated from the core of the industry itself, that is, from the heart of AgTech ecosystems capable of acting as the first promoters of sustainability.

## Principal Megatrends in Agroindustry



Elaboration and graphic reinterpretation by TYLI (5)





**The agricultural  
technology revolution:  
evolving towards  
technological innovation**

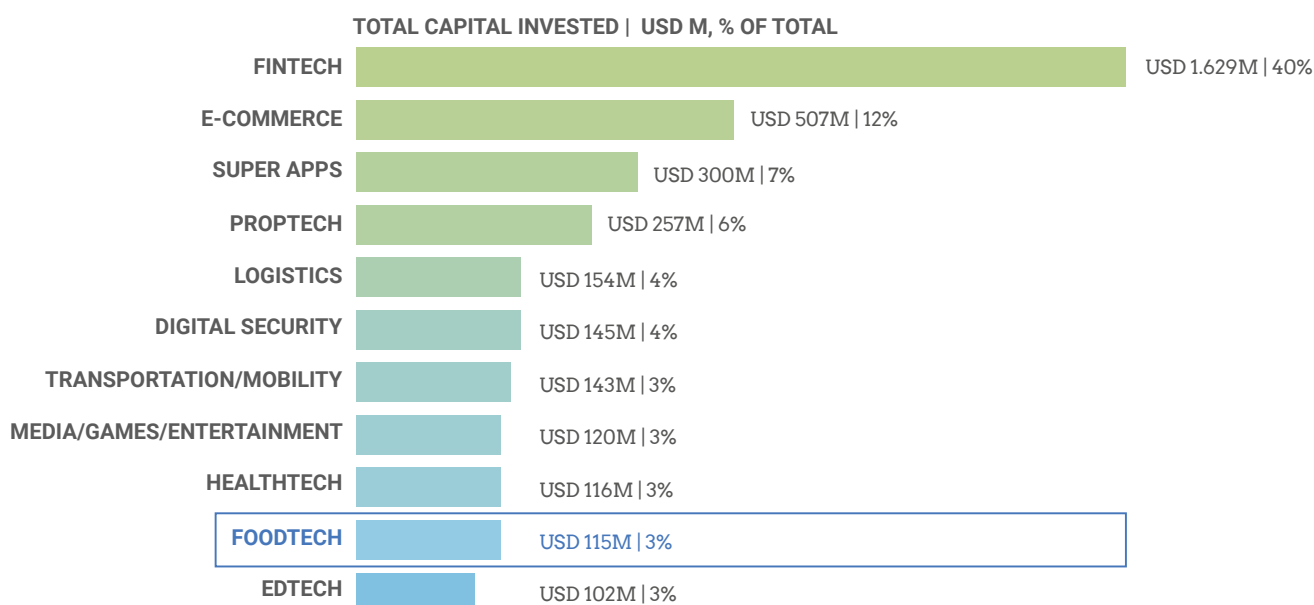
# The AgTech revolution: evolving towards technological innovation

## Innovation and agricultural technology, two essential keys for the promotion of a sustainable agri-food industry

Agricultural innovation and technology are evolving, supported by biotechnology, digitalization, automation and artificial intelligence. The so-called "AgTech", a set of technological innovations that seek solutions to the problems and challenges faced by the agri-food industry, is hailed as one of the main pillars of the fourth agricultural revolution. In line with this, "Sustainable AgTech", a group of companies and businesses that aim to improve people, nature and prosperity, as defined in the 2030 Agenda for Development, through innovative technologies and business models, is transforming the agri-food sector in a disruptive way, enabling it to

achieve high levels of productivity and efficiency, hand in hand with sustainable production. Amid the wave of technological advances surfacing in the world, it should be noted that although it has great potential, digitization has not reached the AgTech sector as it has other sectors. According to the *McKinsey Global Institute's Digitalization Index*(6), the agriculture sector is one of the laggards in digitization compared to other industries, and one of the main barriers to its growth and development is the lack of capital available in the sector. Despite a quadrupling of Venture Capital investment in AgTech sector from 2014(7) to the present, it continues to be one of the least invested sectors.

## VC 2020 | Top sectors in Latam



Elaboration and graphic reinterpretation by TYLI (8)



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**Considering the opportunities and challenges facing AgTech today, and despite its great potential to contribute to sustainable development, we warn that:**



Uneven and inequitable adoption of AgTech solutions poses the risk of becoming a source of exclusion and increased inequalities, adversely affecting developing countries, and within them, small and medium-sized farmers, who are particularly dependent on the agricultural sector.



Technological innovation in the AgTech sector must always be conceived with a focus on sustainability. The increase in startups capable of proposing solutions to problems such as climate change, or the inclusion of women smallholder farmers and producers in the industry, among others, will allow the advancement of a sustainable agroindustry and thus the fulfillment of the relevant goals proposed in the 2030 Agenda.

AgTech is one of the indispensable tools to address the megatrends in the agriculture industry and the promotion of a sustainable Agriculture 4.0. Its ability to positively impact small and medium-sized farmers through social inclusion and empowerment, access to fairer markets and knowledge to develop sustainable agriculture, gives it a unique responsibility for the progress and inclusiveness of agroindustry. In view of this, we recognize that there is still a long way to go to achieve these challenges and inundate the entire value chain with sustainable, effective and disruptive solutions.

For this reason we emphasize the need to expand and promote the growth of AgTech ecosystems, incubators for the retention and promotion of innovative talent, startups and institutions that through joint and strategic work can accelerate the development of innovation and technology. With the goal to make it available to all, thus transforming the current agri-food systems into inclusive production systems, with positive environmental impacts and capable of transforming their local and regional scope.



**Ecosystems,  
main promoters of human talent  
for innovation and  
technology development**



# Ecosystems, main promoters of human talent for innovation and technology development

## Innovation ecosystems, challenges and opportunities for local development

Startups have the ability to drive positive change by creating jobs, diversifying the income of nations, renewing the business base and competitive practices of companies and impacting the development of innovative entrepreneurship ecosystems(9). All this potential of startups can have a great global impact if entrepreneurial talent is educated and encouraged to develop innovation and technology in the

service of sustainability. Thus, if the change of behavior in the markets and the renewal of the business base produced by startups is aligned with the SDGs and the goals proposed in the 2030 Agenda, we will be in a much better position to face and overcome the challenges posed by the global megatrends.

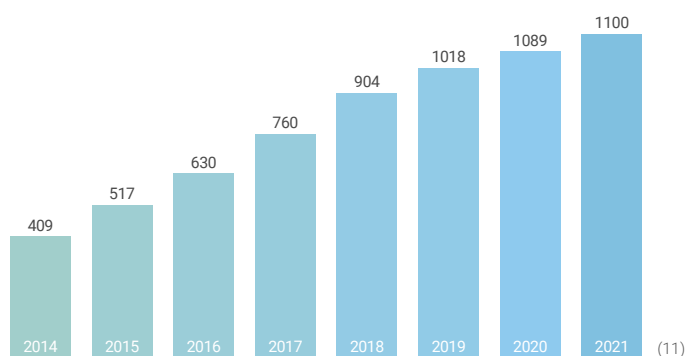
### Latin America's AgriFoodTech opportunity

Latin American entrepreneurs are rapidly accelerating AgriFoodTech innovation across the region.

**+1100**  
AgriFoodTech StartUps

The number of  
**Latam AgTech**  
Startups increased

**100%**  
in the last 5 years



#### Startups per country

**BRAZIL: 440**  
**ARGENTINA: 159**  
**CHILE: 97**  
**MEXICO: 49**  
**COLOMBIA: 45**  
**URUGUAY: 24**  
**PERU: 20**  
**CENTRAL AMERICA/CARIBE: 19**  
**PARAGUAY: 3**  
**BOLIVIA: 2**  
**ECUADOR: 2**

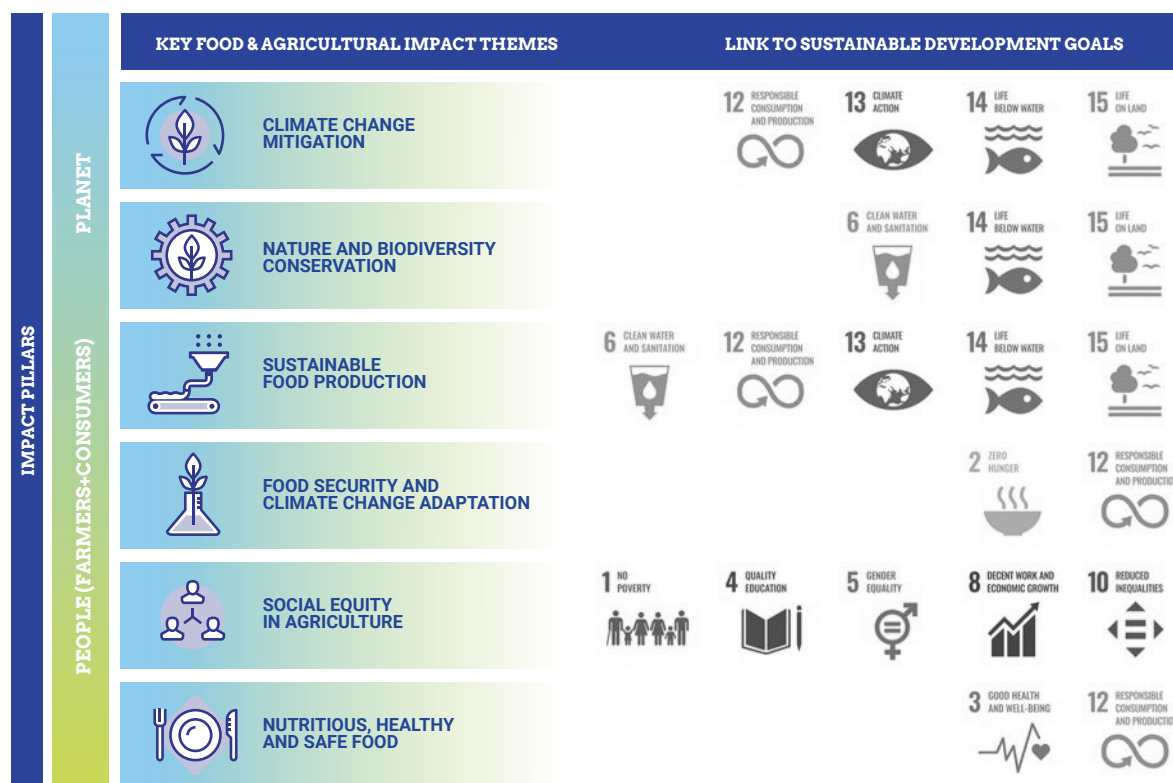
Latin American AgriFoodTech startups by inception year (accum.)

Elaboration and graphic reinterpretation by TYLI (10)

But for all this to happen, it is essential to have an optimal ecosystem, where the presence of certain actors and elements contribute to the growth and promotion of sustainable companies, until they can achieve the results expected. A local innovation ecosystem can be defined as "a community of interconnected actors, based in a specific place, who interact in order to create and support innovation processes, together with the infrastructure and enabling environment that allows them to develop and disseminate

solutions to local challenges"(12). What is observed in these spaces of interaction and collaboration is that, if separately each of these actors drives the entrepreneurial activity, this dispersed force is not enough to sustain or propel it. However, all these elements together, integrated into a holistic system, have the capacity to accelerate the creation and development of an entire sector, impacting both industry and society. We present here the main areas where the development of AgTech ecosystems can have an impact:

## Main areas where AgTech ecosystems impact



Elaboration and graphic reinterpretation by TYLI (13)

As we have been pointing out throughout the document, the promotion of AgTech ecosystems is one of the key points if we wish to promote sustainable agri-food systems that can positively impact societies, taking into account that today they are challenged to progress by facing issues such as the

retention of innovative talent and human capital within local communities, recognizing that these constitute the basis for the development of a new paradigm of agribusiness, aligned with the values of sustainable development.





# The way to create, develop and maintain sustainable AgTech ecosystems

A synthesis of the proposed framework

A large part of the research on innovation ecosystems in developed and developing countries highlights the need to adopt a multidimensional evaluation approach, taking into account the various areas that can affect innovation in a region, and how they interact and relate to each other. In this way, and taking into account these perspectives, the following framework distinguishes four key elements that make it possible to identify and evaluate the stages of development and evolution that AgTech ecosystems experience: Agents, Pillars, Resources and Drivers. These four pillars act as starting points, identifying the complexity of the ecosystem and its particularities in the industry.

# The way to create, develop and maintain sustainable AgTech ecosystems

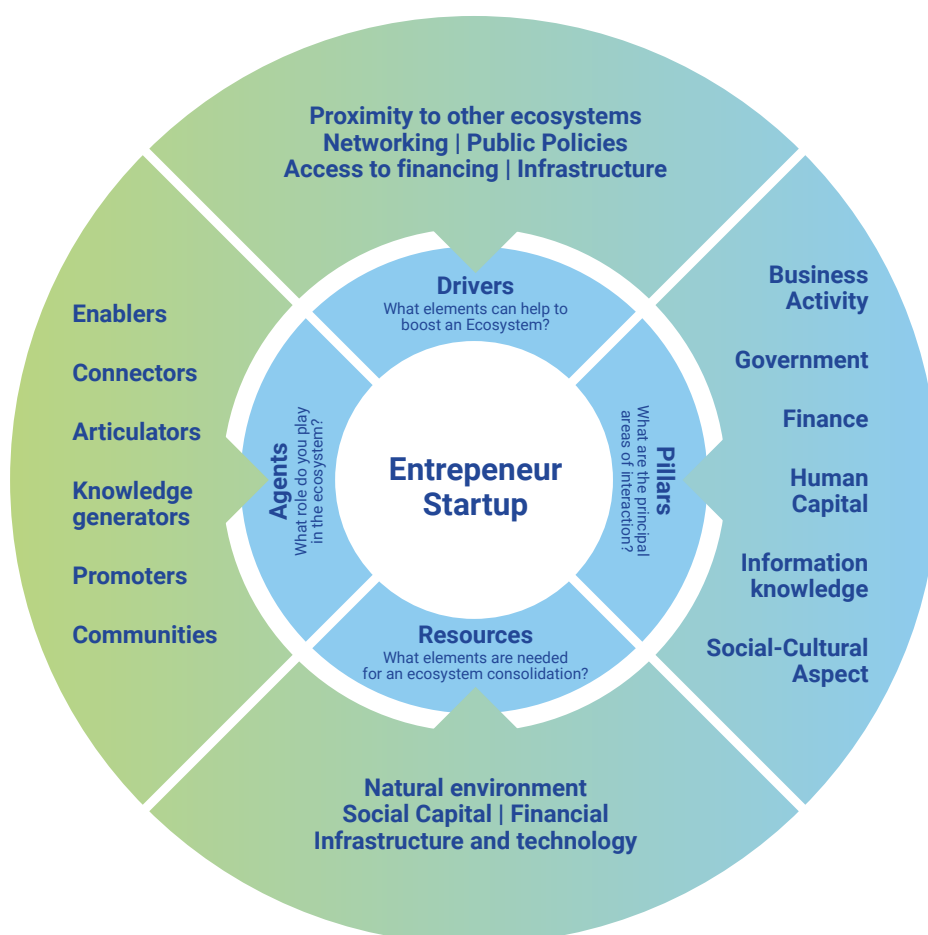
## Framework, objective and approach

Given the importance of supporting the development of AgTech ecosystems, we propose a methodological framework to analyze the composition and stage of innovation ecosystems, highlighting their contribution and value at each stage of their evolution. To this end, the following framework identifies the elements that enable the creation, development and acceleration of AgTech ecosystems. We point out that this framework is the result of an in-depth

comparative analysis carried out taking into account different frameworks proposed for innovation ecosystems(14). Based on this analysis, this framework provides a starting point for developing more detailed descriptions, maps and analyses of innovation ecosystems specific to the AgTech sector. We encourage ecosystem stakeholders to use this tool as a guide and resource that can be adapted and modified to fit the reality of their local context.

## Agtech Ecosystem Elements

Accelerator Government VC
Foundations NGOs Consulting Groups CoWorking Infrastructure
Public - Private Organizations
Science and Tech Organizations
Networks Communities Media and Comms
Formal or informal Communities





## Agents

What role do you play in the ecosystem?

In general, there is a broad consensus that certain types of actors are essential to achieve a balanced, dynamic and robust ecosystem. The different ecosystem stakeholders are connected through a common purpose, which mobilizes the actions and contributions of each other. Its ultimate goal is to support the needs of the community to which it is integrated; considering that at the center of the ecosystem, and as the main agent of change, are located entrepreneurs and startups around which the different types of agents, that shape and build the ecosystem are nucleated, contributing through their differentiated roles:

- **Enablers:** They provide material and immaterial resources for the efficient and effective functioning of the ecosystem; they are responsible for fostering the development of entrepreneurial innovation capabilities that allow the expansion of business opportunities.
- **Connectors:** They generally act as gateways to the ecosystem. They connect startups, entrepreneurs and other related agents with potential strategic allies with common purposes.
- **Articulators:** Provide guidance and pro-collaborative exchange tools to work on joint actions that contribute to the interests of the agents.
- **Knowledge generators:** They are responsible for generating and transferring new technology-based and social-scientific knowledge for its effective use by the ecosystem's agents.
- **Promoters:** Disseminate and communicate actions that stimulate the culture of entrepreneurship and investment; promote an educational environment of specialized diffusion to the community.
- **Communities:** They are involved in sharing knowledge and learning and in creating trust networks of group interest to sustain collective action.

## Pillars

What are the principal areas of interaction?

We believe that a framework adapted to AgTech ecosystems should consider the following pillars and key players associated with each of them. We also distinguish that the recommended areas should be observed in terms of their capacity to influence the AgTech ecosystems themselves, for which we propose the following analysis criteria:

- **Direct influence:** Human capital, business activity and investment.
- **Partial direct influence:** Development of knowledge and information and public policies.
- **Indirect influence:** Culture

## Resources

What elements are needed for an ecosystem consolidation?

The resources can be considered as "nutrients" for the development of the ecosystem; that is, they are those elements that contribute to, and can directly or indirectly affect the quality and capacity to produce innovation within the ecosystem. We consider that the enabling environment for an AgTech ecosystem includes aspects of the local context that affect how well the system functions, and we highlight below four resources that we consider relevant for the proper functioning of these ecosystems, regardless of their geographic and/or cultural context:

- **Natural Environment:** The environmental characteristics of a place, natural capital and its ecological resources form a crucial context and act as a catalyst for innovation in terms of constraints and opportunities
- **Social Capital:** They are those resources such as information, trust and norms that function within a community and create benefits for the group. These can affect the ability of group members to bond and develop networks for joint action, which are essential for the development of innovation processes.
- **Financial:** Refers to the types and amounts of financing, financial products and related services that are available to innovators to support their process. Includes different types of financing (grants, subsidies, loans, financial services, banking, insurance, credit and others).
- **Infrastructure and technology:** Includes networks, systems and tangible and intangible facilities necessary for the development of the innovation-oriented activity. (roads, electrical and Internet networks, information systems and others).

## Drivers

What elements can help to boost an Ecosystem?

Finally, these are the elements that are considered fundamental to maintain and accelerate ecosystems, whatever stage of development they are in:

- **Public policies**
- **Infrastructure**
- **Access to financial**
- **Network**
- **Proximity to other ecosystems**

As can be seen, some of the components listed above are repeated throughout the whole framework, as in the case of infrastructure and financing, mainly because these elements are vital factors for the development of ecosystems in the different stages they go through.

## Keys to strengthen ecosystems according to their stage of development

<b>Emerging ecosystems</b>	They are those innovation ecosystems that are just beginning to form. In this environment some actors are present, but others are missing, and key resources and enabling conditions are often absent or weak.	To strengthen this type of ecosystem, it is necessary to work on building a joint vision among those who are already innovating; establish common relationships, values and norms; strengthen the capacities of existing agents and create new actors and resources.
<b>Ecosystems under validation</b>	These ecosystems have more actors and resources than nascent ecosystems; they are characterized by having achieved strengths in some areas, but remain weak and need resources to boost their growth.	In order to strengthen these environments, it is necessary to convene all stakeholders to identify the strengths and weaknesses of the system and design a development plan and strategy.
<b>Established but disconnected ecosystems</b>	These ecosystems are characterized by the presence of many actors and initiatives that are not operating synergistically in favor of innovation development.	To strengthen this type of ecosystem, it is essential to invite all the actors involved to design a strategy to reduce efforts and increase confidence in order to improve the capacity for collective action.
<b>Ecosystems in acceleration</b>	This type of ecosystem is characterized by having achieved a balance between the participation of different actors, the development of action strategies and access to resources. All these factors start to work, impacting the economy and social development of the place where they are established.	To accelerate this process, it is necessary to work in a coordinated manner to maintain the balance achieved through joint action strategies that allow a continuous flow of access to the necessary resources. It is also essential to connect with other ecosystems to exchange learning and nurture each other.





# Inspirational models of AgTech ecosystems

## *Introductions, Comparisons and Lessons learned*

In order to evaluate and understand the value added by AgTech ecosystems for the development of a sustainable agroindustry, and following the line of analysis proposed in the framework developed, we present three cases of relevant AgTech ecosystems at different stages, and whose development and evolution experience allows us to confirm how relevant these spaces are to face the megatrends that the agroindustry must overcome.

The chosen cases are: 1-The Saint Louis ecosystem, which is in the process of acceleration; 2-The Piracicaba ecosystem, which is in the process of validation; 3-The Rosario ecosystem, which is in an incipient stage and has experienced significant growth in recent years.

# St. Louis Missouri, a vibrant and expanding AgTech ecosystem

## Context

If we want to look at an AgTech ecosystem that serves as a mirror and a model, we should undoubtedly look at the AgTech ecosystem of St. Louis, Missouri. Strategically located in the center of the United States, with a road infrastructure that allows it to connect with both the West and the South of the country, and almost half of all crops and livestock in the United States are produced within a 500 mile radius of the St. Louis region and where the freight and rail system facilitates the global connectivity of the agricultural industry. The region's unique infrastructure (15) and the intellectual capital provided by institutions such as Bayer Crop Science, Bunge headquarters, the United Soybean Board, The Donald Danforth Plant Science Center, the National Corn Growers Association, US Farmers and Ranchers in Action and other ag-oriented organizations are conducive to the development of a thriving and vibrant AgTech ecosystem. In addition, St. Louis has outstanding examples of relevant startups within the sector, funded and scaled, such as [Plastomics](#), [Impetus Ag](#), [CoverCress](#) and the publicly traded [Benson Hill](#). All these factors make this AgTech ecosystem a place to create, collaborate and grow innovation for the

development of a sustainable agribusiness. In terms of Venture Capital we note that the St. Louis ecosystem has extensive experience in financing AgTech startups and innovations at different stages.

Funds such as [The Yield Lab](#), [BioGenerator](#), and other strategic investor groups such as [Lewis & Clark Agrifood](#), invest in AgTech startups at various stages. [The Yield Lab Institute](#), a global think tank in the AgTech sector and the non-profit arm of [The Yield Lab](#), plays a fundamental role in the interaction and convening of the various players in the ecosystem, supporting and accelerating innovation in the sector from St. Louis and around the world.

It is globally recognized that the AgTech ecosystem of St. Louis, including the Metropolitan Statistical Area (MSA)(16), is well established and is currently continuing its acceleration and expansion process. This significant growth can be verified through the data published by the [St Louis AgriBusiness Club](#), which since 2004 has been tracking and statistically measuring the evolution of the ecosystem. The latest report corresponds to the year 2020 and presents a clear vision to understand the impact that this ecosystem is having on the growth of the economy and social development at local, regional and national levels:

## St. Louis AgriBusiness Economic Contribution

Elaboration and graphic reinterpretation by TYLI (17)

**\$43 Billion**

in St. Louis Metro total sales from AgriBusiness and indirect sales

**166.633 Jobs**

in St. Louis Metro from AgriBusiness and indirect sales

**12.8%**

of St. Louis Metro total sales from AgriBusiness and indirect sales

**9.3%**

of St. Louis Metro jobs are from AgriBusiness and indirect firms

DIRECT IMPACT	Description	Jobs	Labor Income	GDP	Gross Sales
	Direct AgriBusiness	84.103	\$5.5B	\$10.2B	\$28.5B
	Production Agriculture	13.530	\$231M	\$499M	\$1.6B
	Processing Manufacturers	21.388	\$1.6B	\$3.8B	\$12.9B
	Inputs & Services	49.185	\$3.6B	\$5.8B	\$14.1B
INDIRECT IMPACT	Description	Jobs	Labor Income	GDP	Gross Sales
	Supplier Spending	35.798	\$2.5B	\$4.1B	\$7.5B
	Household Spending	46.732	\$2.3B	\$4.2B	\$7.1B

**TOTAL IMPACT**

Jobs	Labor Income	GDP	Gross Sales
<b>166.633</b>	<b>\$10.3B</b>	<b>\$18.4B</b>	<b>\$43.1B</b>
<b>9.3%</b>	<b>9.2%</b>	<b>10.3%</b>	<b>12.8%</b>

AgriBusiness Contribution  
Percent of St. Louis Metro

Notes: In 2020 Dollars. M for millions, B for Billions, GDP is Gross Domestic Product  
St. Louis Metro is the 15 Country/City Metropolitan Statistical Area. Numbers may not sum due to rounding.

Notes: In 2020 dollars. M for millions, B for billions. GDP is Gross Domestic Product. Figures may not sum due to rounding. IMPLAN's annual fiscal estimates use state and federal tax collection data from the U.S. Census which does not capture unique situations such as tax abatements/exemptions, so should be considered a broader measure. St. Louis metro area economic statistics: \$179 billion in GDP (Gross Domestic Product). 1,784,000 in total employment (full and part-time employment). (Source: 2018 IMPLAN data based on U.S. Bureau of Economic Analysis metropolitan figures. GDP adjusted to 2020 dollars).

# Piracicaba, an AgTech ecosystem that is making strong advances from Brazil

## Context

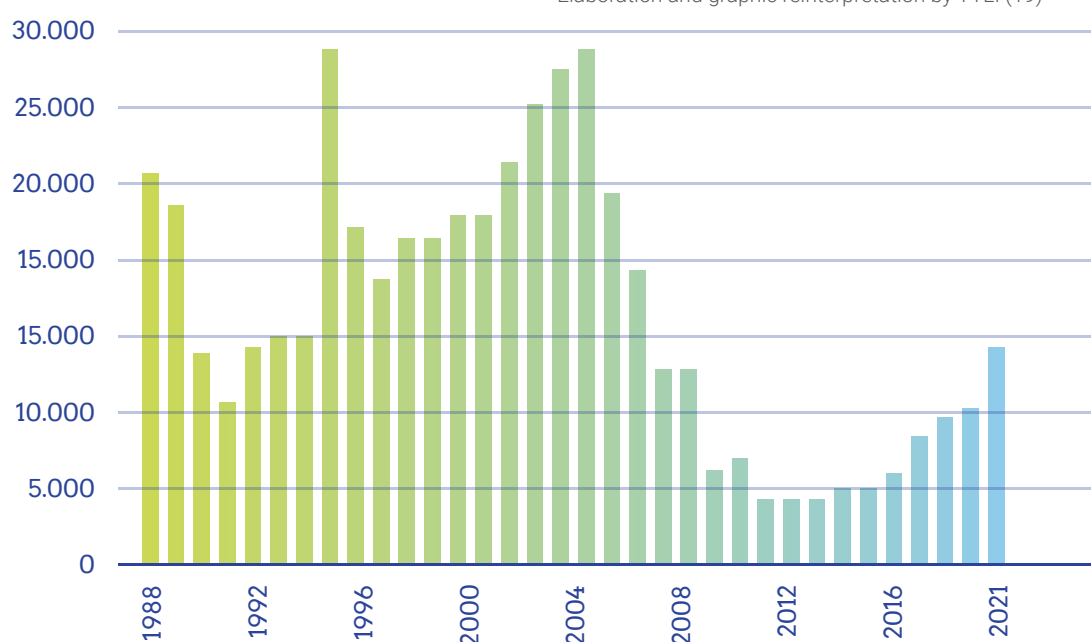
In recent decades, Brazil has developed a model of tropical agriculture that is unparalleled in the world, with a model based on science, innovation and entrepreneurship, positioning itself as one of the largest exporters of agricultural products in the world. It should be noted that Brazil is a tropical agricultural power, and its agronomic activity requires very specific techniques and technologies. With a climate that allows two or three harvests a year, it is also subject to a high incidence of pests, diseases and weeds. Likewise, the territorial extension and the size of the productive farms represent a scale of agriculture different from that of other countries. However, when we talk about Brazil's potential for agroindustry, we cannot ignore the increasing rates of deforestation in the Amazon rainforest that have been occurring since the 1990s. Logging has advanced at a variable but rapid pace, with cattle ranching and agriculture being the main activities responsible. Large and medium-sized ranches

account for about 70% of logging activity. Forest degradation is the result of logging, ground fires (facilitated by logging), and the effects of fragmentation and edge formation that contribute to forest loss. The impacts of deforestation include loss of biodiversity, reduction of the water cycle (and rainfall) and contribution to global warming(18).

In this scenario, Brazil has an important challenge ahead: to demonstrate that it is possible to be an agro-industrial power, preserving and expanding its unique natural and environmental heritage through innovation and technological development; driving sustainable agriculture from within its vibrant AgTech ecosystem.

### ANNUAL DEFORESTATION OF THE BRAZILIAN AMAZON IN KM2

Elaboration and graphic reinterpretation by TYLI (19)





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According to recently published studies (Radar Agtech Brasil 2020/2021)(20), the constant increase in the number of startups within the AgTech sector demonstrates that the Brazilian agricultural innovation ecosystem is certainly one of the most dynamic in the world. For its part, the state of São Paulo maintains the leadership in terms of agtechs, with 48% of the total number of startups, with a high level of institutions that are supporting and investing innovation in the agricultural sector, through incubation, acceleration and investment opportunities. The Startup Ecosystems Ranking 2020 (STARTUPBLINK, 2020)(21) ranked the city of São Paulo as the 18th startup ecosystem in the world. In addition, the Global Startup Ecosystems Report (STARTUP GENOME, 2020)(22) placed São Paulo in 30th position, being the only Latin American city ranked among the 30 most relevant ecosystems in the world in both studies, taking into account the quantity of startups, quality of the ecosystem and entrepreneurial environment, performance, funding,

resource attraction, market, connectivity, experience, talent, connection with the founder/entrepreneur and locality (STARTUP GENOME, 2020). Another important fact is that most startups are focused in the area of biotechnology with a focus on sustainability, innovative foods and new food trends. In this context, we note that the AgTech ecosystem of Piracicaba, a city located in the state of São Paulo and known for producing 90% of the country's sugarcane destined primarily for the production of biofuels, has positioned itself as one of the most outstanding in the country, following in the footsteps of the St. Louis ecosystem and being a regional reference as a model of the innovative AgTech ecosystem.

# Rosario's AgTech ecosystem, a seedbed of outstanding innovative talent

## Context

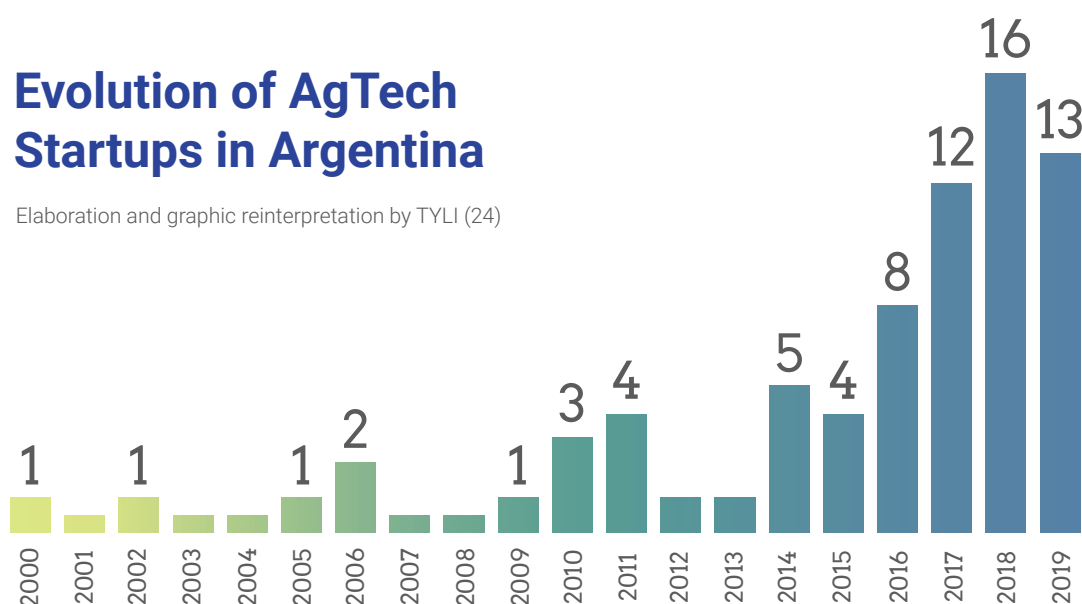
The potential of agribusiness in Argentina, particularly in the so-called Central Region of the country (which includes the provinces of Córdoba, Entre Ríos and Santa Fe), is widely known at international level. According to studies(23), 67% of the value added by Argentina's agri-food chains is produced in this region, where a promising ecosystem, known as the Rosario AgTech ecosystem, is beginning to emerge. It is worth noting that, although this incipient ecosystem has a low volume of funds compared to AgTech ecosystems in other countries, it has shown significant growth in recent years. One of its fundamental pillars has undoubtedly been the innovative talent of entrepreneurs, who are committed to building a sustainable agribusiness, capable of responding to global megatrends, have committed to the development of startups focused on building technological solutions that allow agricultural companies to lower costs, be more efficient in the use of inputs, improve business and environmental management, transforming agronomic events into

sustainable processes through traceability, opening a world of opportunities for agribusiness in the region.

The Rosario ecosystem is currently facing a growth process focused on two specific fronts(25): 1 - improving connectivity between the various actors through the development of joint strategies through public-private alliances and programs; 2 - boosting and fostering human talent, the basis for transforming the local ecosystem and promoting a sustainable agri-food industry model in the region, through programs to support and encourage Agtech innovation carried out by various institutions of the ecosystem.

## Evolution of AgTech Startups in Argentina

Elaboration and graphic reinterpretation by TYLI (24)



## Comparison between the three cases of study

## St. Louis Missouri (USA)

<b>Pillars</b>	Human capital, finance, infrastructure and public policies. Structure currently accelerated by an important strategy of connectivity between actors.
<b>Agents</b>	Educational and research institutions, corporations related to the agricultural sector and various agricultural interest groups. The main universities and corporations in the St. Louis region play a fundamental role within the ecosystem, fostering the development of human capital linked to the sector, and acting as catalysts of entrepreneurial talent, seedbed for the creation of AgTech startups.
<b>Human Capital</b>	The St. Louis metropolitan area has 53 academic institutions that represent a great source of talent, especially in the field of agri-technology. In the state of Missouri, more than 25 colleges and universities have programs dedicated to agriculture(27). St. Louis also benefits from the talent of universities with top-tier programs located in surrounding states, such as the <a href="#">University of Illinois</a> at Urbana-Champaign, the <a href="#">University of Missouri</a> and others. In line with this, and according to studies conducted in the sector(28), we observe that the founders of the Startups that are settled in the St. Louis ecosystem, and who represent a fundamental part of the human capital of the same, have a high degree of academic training (masters, doctorate) and a large part of them worked in universities and/or spent a significant part of their career in companies before or during the founding of their agri-tech company.
<b>Financial Capital</b>	St. Louis has historically been a key center of financing associated with agriculture. In recent years, agricultural technology-related industries have experienced significant growth supported by a variety of sources, including venture capital, angel investors, corporate and government funding. We further note that institutions such as <a href="#">Rabobank AgriFinance</a> , U.S. Trust, Enterprise Bank, Co-Bank and Wells Fargo, as well as others with a strong presence in the area, play a key role in financing real agricultural operations.
<b>Public Policies</b>	State and local governments have long supported agricultural industries and AgTech. Laws such as the Farm Bill, tax incentives, government subsidies and infrastructure development demonstrate the political sector's support for the development of the ecosystem. The government understands that the success of the Agtech ecosystem will play an important role in the success of the United States and the world in the future.
<b>Infrastructure</b>	The region has more than 200 spaces for AgTech momentum, provided by research institutes that offer shared workspaces, such as the Donald <a href="#">Danforth Plant Science Center</a> , BioSTL/BioGenerator, BRDG Park, <a href="#">EDGE</a> at <a href="#">BRDG</a> and the <a href="#">Helix Center</a> , to name a few whose catalysts are rooted in the city's cultural elements.
<b>Connectivity</b>	Examples of programs that drive connectivity across institutions: - <a href="#">Missouri Innovation Center (MIC)</a> , a non-profit organization focused on supporting businesses from a sustainable approach. In 2016, MIC created the Accelerator Fund to help entrepreneurs flesh out a business model and create an initial product/service. - <a href="#">Missouri Technology Corporation (MTC)</a> , a public-private organization, fosters the growth of new and emerging high-tech companies" by investing locally in infrastructure, entrepreneurs and R&D through its Missouri Building Entrepreneurial Capacity grant program. MTC promotes the development and growth of companies engaged in science and technology transfer for job creation under various programs. It also provides pre-seed capital, seed capital, venture capital and expansion-stage debt to entrepreneurial companies in the AgTech ecosystem.



## Comparison between the three cases of study

## Piracicaba (Brasil)

<b>Pillars</b>	Human capital, finance, infrastructure and public policy. Driven by progress in connectivity.
<b>Agents</b>	These include the São Paulo state government and municipality; the <a href="#">São Paulo State Technological School</a> ; the <a href="#">Federal Institute of Education, Science and Technology</a> ; and the <a href="#">Luiz de Queiroz School of Agriculture (ESALQ)</a> (26). Companies also play a key role in this ecosystem. One example is <a href="#">Raízen</a> , the largest producer of ethanol from sugarcane and the third largest energy company in the country. This company has developed an interesting incubation program to promote innovation: " <a href="#">Pulse</a> ", from which it works in collaboration with important local and international accelerators.
<b>Human Capital</b>	<a href="#">The Luiz de Queiroz School of Agriculture</a> is one of the most important players in the ecosystem of Piracicaba, and a reference in Latin America in the treatment of topics related to agriculture and livestock. It acts as an important provider of support to startups, entrepreneurs, innovation space, networks and others. There is currently a widespread lack of knowledge and training in the field of entrepreneurial skills. To fill this gap, professors and entrepreneurs are developing training and interdisciplinary programs through universities that favor the development of business resources for entrepreneurs.
<b>Financial Capital</b>	Recent years have seen an increase in the flow of financing to farmers and cooperatives in the region. Innovative sources of seed or angel capital are starting to grow in the area, although most of these actions still lack maturity and coordination. The development in São Paulo of funds focused on AgTech, as well as the launch of a venture debt fund such as <a href="#">The Yield Lab Latam</a> , <a href="#">SP Ventures</a> , <a href="#">Barn Investimentos</a> , <a href="#">Kaeté Investimentos</a> and others shows the continued evolution and presence of venture capital fostering the ecosystem from incubation programs. A greater flow of financing is detected in companies in more mature stages.
<b>Public Policies</b>	Since the 1990s, successive Brazilian governments have focused on addressing institutional and regulatory reforms to favor different sectors(32), promoting federal and state programs focused on public investment for infrastructure development, increasing tax and credit incentives to encourage private investment. In addition, since 2000, the Brazilian government has worked to improve patent protection, facilitating technology transfer in the sector. Furthermore, the region has begun to develop local public policies to respond to specific demands and needs in a more agile manner.
<b>Infrastructure</b>	The last decades have seen significant progress in infrastructure development in the Piracicaba area, including hubs and incubators, government-backed centers, business-funded accelerators, and testing facilities supported by companies and universities. In addition, numerous entrepreneurial initiatives and public and private investments in recent years have led to improvements in rural logistics infrastructure and digital connectivity, representing great progress for the entire AgTech ecosystem. <a href="#">The Technology Park</a> of 2.2 million square meters where most of the startups are located stands out.
<b>Connectivity</b>	We observe that Piracicaba's ecosystem is beginning to consolidate its connectivity through programs and institutions that develop and promote cooperation between different actors. Institutions such as ESALQ University, the city's new Technology Park, as well as an impressive network of accelerators and coworking spaces that generate innovation, and a large number of entrepreneurs and startups, are making Piracicaba a privileged place for innovation. An example of this growing connectivity is <a href="#">AgTech Garage</a> , one of the world's leading agribusiness innovation centers, based on a new dynamic of innovation in agribusiness, characterized by being open, networked, collaborative and agile.

## Comparison between the three cases of study

## Rosario (Argentina)

<b>Pillars</b>	The main pillar is human capital, which has allowed the development of an important innovative talent in the region. In terms of investment, infrastructure and public policies, these have been inconsistent over the last few years. There are ongoing projects of public-private initiatives that will have a positive impact on the strengthening of the essential pillars for the development of the ecosystem in the short term.
<b>Agents</b>	The work of agents from the private sector and, to a lesser amount, from the public sector, mainly through partnerships with the private sector, stands out. At the academic level and constantly promoting research is the <a href="#">Austral University</a> and its <a href="#">Agribusiness and Food Center</a> ; on the other hand, the <a href="#">Rosario Trade Exchange</a> , a non-profit civil association promoting innovation and entrepreneurship in the AgTech sector through programs such as <a href="#">BCR Innova</a> ; also noteworthy are the VC investment fund focused on Agtech vertical as <a href="#">Yield Lab Latam</a> , incubators such as <a href="#">CITES</a> , accelerators such as <a href="#">Glocal</a> and <a href="#">CONICET</a> , as well as institutions such as Endeavor with strategic programs to support startups through mentors and a wide network of contacts.
<b>Human Capital</b>	Human capital plays an important role in helping to drive innovation and the adoption of new technologies. According to surveys of experts(29), universities, companies and stakeholders are fostering the seed capital of entrepreneurial talent. As for the universities, both public and private, due to the economic development and the region's geographic framework, it is observed that a large number of students study careers related to agribusiness (as in the case of Piracicaba). <a href="#">The Agribusiness and Food Center of the Universidad Austral</a> stands out, which promotes the capacity of the agroindustrial sectors to create and lead opportunities and trends related to agribusiness and food.
<b>Financial Capital</b>	The region has grown in recent years in funding opportunities from government and institutional investors (international/local venture capitalists, accelerators and corporates)(30). However, flows remain considerably low compared to what is needed to support the growing wave of maturing startups in the ecosystem. Accelerators and incubators provide funding primarily for early stage ventures; funding for Series A to C rounds continue to lag, pushing nascent companies into the so-called "Valley of Death"(31), i.e. a period of time (spanning from when a startup receives initial funding until it starts generating revenue) where they are left vulnerable to cash flow needs.
<b>Public Policies</b>	In the last 5 years there has been progress in the field of public policies with a positive impact on the development of the AgTech ecosystem in Rosario. There has been an increase in national and local government programs (for example, the "Entrepreneurs Law" that facilitates the creation of startups and promotes tax incentives for them). Despite this, it is observed that governmental changes in recent years and the political and economic ups and downs of the country have had a negative impact on the development of public policies to support the growth of the sector. Currently, startups must overcome important challenges in the legal, fiscal and financial areas, often postponing innovation in order to address structural issues.
<b>Infrastructure</b>	The infrastructure network that feeds Rosario's AgTech ecosystem is not concentrated around a single node, but rather the key players are scattered throughout the province and the country, which creates unique obstacles and opportunities for this ecosystem. Rosario has some key organizations that provide access to resources, space and mentoring for startups in the region; among them are <a href="#">CITES</a> , a technology incubator focused on early-stage technology startups, mainly in biotechnology; the <a href="#">Conicet's Biotech Venture Accelerator</a> led by the <a href="#">Ministry of Science Technology and Innovation</a> , a joint collaborative effort with the private sector that aims to improve the performance of local startups; the <a href="#">Rosario Trade Exchange</a> promotes research and accompanies entrepreneurs and startups through programs such as <a href="#">BCR Innova</a> ; the <a href="#">Polo Tecnológico</a> , a public-private partnership focused on creating technological solutions for startups through the growth of information technology, communications and biotechnology.
<b>Connectivity</b>	A major challenge for Rosario's AgTech ecosystem is to improve its connectivity. There are known initiatives on the part of the ecosystem's stakeholders to improve its connectivity; an example of this is the strategy " <a href="#">Agenda del Conocimiento</a> ", " <a href="#">Transformando Santa Fe</a> ", " <a href="#">Puerto de la Innovación</a> ", among others. We also highlight initiatives for ecosystem connectivity such as the Agtech Roundtable convened by the Ministry of Production of the province of Santa Fe, which seeks to articulate actions between the public and private sectors. The table has more than 40 referents linked to innovation, new technologies in agriculture, logistics, markets, software, agricultural services companies, startups, accelerators, engineers, scientists, producers, technology poles and also members of <a href="#">Conicet</a> , <a href="#">Inti</a> , <a href="#">Inta</a> and the Austral University, thus proving to be a space of connection for the entire ecosystem. Another outstanding initiative is the " <a href="#">Twinning Agreement between the city of Rosario and the city of St. Louis (United States)</a> ". The cities of Saint Louis and Rosario celebrated their twinning in 2017 after the signing of a document through which both cities committed to work together, addressing common issues and challenges. This agreement undoubtedly represents a gateway to shared opportunities, capable of enriching the communities. Within the framework of this agreement, the " <a href="#">AgTech Connect</a> " program has recently been held, through which 15 Argentine Startups have been able to travel to St. Louis and begin to establish business relationships in this region.



## Lessons learned on the three ecosystems analyzed

The St. Louis AgTech ecosystem has a large number of agents and resources that, connected through important strategies and with the support of funding and public policy momentum, have allowed it to grow as an AgTech ecosystem, currently positioning itself as a center for the creation and hosting of Startups at a regional and global level. St. Louis is committed to the future of sustainable agribusiness and is today undoubtedly an epicenter for scientists, thought leaders, farmers, investors and entrepreneurs who work strategically to address key issues for the promotion of efficient and sustainable agri-food systems from the region to the world.

On the other hand, and recognizing the enormous potential of agribusiness in LAC to promote environmentally friendly agri-food systems supported by technology and innovation, we note the important work that Piracicaba's AgTech ecosystem is beginning to develop to achieve this goal. Piracicaba is today a seedbed of entrepreneurial human talent focused on developing solutions that enable greater efficiency, productivity and sustainability in the sector. However, we recognize that in order to grow and empower itself to achieve its goal, Piracicaba needs to increase its flow of financing, reduce technological gaps in strategic areas for the competitiveness and sustainability of agricultural production chains, advance in management models that allow greater use of financial, human and infrastructure resources, and achieve greater partnership between public and private actors. Piracicaba's potential to position itself as a focus of sustainable agri-food production is enormous, but for this to happen it is essential to encourage the development of a solid and robust AgTech ecosystem, where the various actors can work strategically to position the region's agribusiness among the most sustainable in LAC and the world.

In line with what was said about Piracicaba, we also highlight

the enormous capacity of Rosario's Agtech ecosystem to encourage the development of sustainable agribusiness in South America and we note that this potential is already being developed and consolidated at the local level. However, due to the incipient phase of this ecosystem, the need is imminent to promote and strengthen the conditions for innovative human capital to consolidate in the region, without having to emigrate in order to seek incentives or support for the development of their entrepreneurship. To this end, it is extremely important that the ecosystem is strengthened through joint action strategies among the various actors, and that it can also count on a constant flow of funding and public policies that are respected and sustained over time. It should also be highlighted that the case of Rosario represents one of the many cases of emerging ecosystems that are being consolidated in LAC; Rancagua, Talca and Osorno (with its dairy zone) in the Central Valley of Chile, Puerto Montt in the south of Chile with the fish farming, Londrina and Cuiabá in Brazil, Río Cuarto in Argentina, Medellín and the Coffee Axis (Manizales, Armenia and Pereira) in Colombia and Guadalajara in Mexico.

Convinced that the purpose of AgTech ecosystems is not only to promote solutions for the development of efficient agricultural production, but also to promote a sustainable agribusiness, we emphasize that St. Louis, Piracicaba, Rosario and the other emerging AgTech ecosystems in LAC, have a unique opportunity to take advantage of this challenge. In a world that needs human capital and innovative talent qualified to promote new paradigms and respond to global megatrends in line with the SDGs and the 2030 Agenda, these case studies allow us to understand how AgTech ecosystems function as seedbeds and providers of human talent, fostering the promotion of a new vision of agroindustry, from which it will be possible to build sustainable agri-food systems.





## Conclusions



## Conclusions

### Final thoughts on the importance of fostering AgTech ecosystems

Recent years have demanded flexibility and adaptation to change at unprecedented speeds from global society. The world is facing what experts warn is an imminent climate crisis, and according to scientists, unless humanity drastically reduces its greenhouse gas emissions, the Earth faces a future of heat waves, food shortages and disruptions. In this race against time to reduce greenhouse gas emissions, save Biodiversity and reduce pollution, digital technologies, among other solutions, have the capacity to move at the speed and scale needed to achieve the dramatic recovery we need for the next 10 years.

We are at a crucial moment in human history. The decisions we make today to address environmental challenges and digital technology governance will set off a chain reaction that will determine the quality of life for humanity's future. Today, in the midst of the COVID- 19 Pandemic we are faced with the need to build new "protocols" of operation that should serve to overcome not only the post-COVID crisis, but also those shared responsibilities that we cannot postpone as humanity, such as climate change, biodiversity loss, pollution and many others already enunciated through the SDGs. Far from a pessimistic or catastrophic view of reality, now is the time to increase collaboration and innovation to address the triple planetary crisis. That is why in the coming years, it will be vital for countries to harness the power of digital technology. This context opens up unprecedented opportunities for building sustainable agri-food systems, capable of challenging global megatrends and furthering the achievement

of the goals of the 2030 Agenda. We also maintain that the emergence of this new global paradigm requires the agri-food industry to evolve towards a new way of understanding and assuming the responsibilities we have ahead us, building joint initiatives and strategies to promote the development of human capital and innovative talent, generating entrepreneurship and Startups capable of acting as an engine and driver of effective and sustainable ways of producing.

However, this transition requires the urgent promotion of innovation, digitization and thus the entire AgTech sector, working together to impact across the entire value chain of the agrifood industry. Likewise, we must assume that this acceleration cannot be achieved by acting in isolation or individually; this challenge requires the commitment and collaborative work of various actors, both from the public and private sectors, institutions and NGOs that are directly or indirectly linked to the purpose of transforming the current food production systems into efficient and sustainable systems. It is in this context where AgTech ecosystems must play an essential role, acting as the main seedbeds and containers for the development of a sustainable agribusiness 4.0 and assuming the responsibility of being drivers of positive social change.

Considering all the above, we highlight the fundamental aspects that must be strengthened to promote and support the construction and development of AgTech ecosystems up to the current challenges:

### Education in the culture of sustainable innovation

The culture of entrepreneurship and innovation is spreading strongly, and in view of this phenomenon it is essential to strengthen formation and increase support so that human talent can develop skills and knowledge for the construction of a sustainable agri-food industry. We are facing a new era, and we must recognize the responsibility of developing new skills to be able to face it. All the agents of the ecosystem linked to the generation and transmission of knowledge should be in the front line facing this challenge, supported by the rest of the actors.

### Increased investments that accompany the development of ecosystems

Investments generated within AgTech ecosystems can be directed to projects with the capacity to foster the development of technology and innovation for the promotion of productive systems that care for the livelihoods of people and our planet, while generating positive financial returns. There are three ways in which investments in AgTech ecosystems can generate impact: 1- through support for agricultural projects with the capacity to generate practices that have a greater link to the preservation of the planet, such as climate change mitigation, nature and biodiversity conservation and sustainable production; 2- through the drive for the generation of new agricultural production methods and technologies aimed at achieving greater productivity and yield while caring for the planet and people; 3- by contributing to the development of food security by helping to supply healthy, safe and nutritious food to people while combating the challenges arising from climate change adaptation and mitigation.

### Development of a common framework to measure 'impact' in AgTech innovations

AgTech ecosystem players can greatly benefit from having an industry-wide accepted and supported evaluation framework to measure and detect the real potential and impact that startups are bringing, or are capable of bringing, both to the ecosystem and to the localities where they are based.

Finally, we emphasize that agribusiness will face important challenges in the coming years. In a scenario of uncertainties and with an ongoing health crisis, the development of AgTech ecosystems capable of driving the social changes needed to face a new era, generating sustainable production systems that defy megatrends, requires the commitment of multiple actors and their ability to generate coordinated strategies for joint action.

To achieve this purpose will not be possible alone, therefore our call to action is to be part of this dynamic movement to all those who want to join their efforts and commit to the promotion of a sustainable agriculture 4.0, considering that the agribusiness of tomorrow depends more than ever on the choices, decisions and actions of today.



# Appendix



# Appendix

## Methodological Approach

The team used a mixed methodology consisting of a review of documents from primary and secondary sources together with data collected during 17 interviews conducted by teleconference with important stakeholders from the LAC AgTech ecosystem such as academics, researchers, entrepreneurs, business-leaders, and other key players. The Yield Lab Institute secured the selected interviewees, chosen for their experience, their commitment to AgTech ecosystems, and to present the necessary background to provide key information for this document. To understand the value and orientation of the information provided in this document, we note that of the 17 interviews conducted, 7 correspond to agents linked to financing, 7 to knowledge-generating agents, and 3 to articulators within ecosystems.

### Interviewed

**Aline Maldonada Locks**, Associate Founder & CEO at Produzindo Certo.

**Ana Galiano**, Dean of the School of Business Administration Universidad Austral, Argentina.

**Ana Inés Navarro**, Director of the Economics Department at Universidad Austral, Argentina.

**Cristian Sagal**, Investment Promotion Agent, Agribusiness Sector, InvestChile.

**Eugenia Saini**, Executive Secretary at FONTAGRO.

**Fatima Valer**, Service Designer - Scientific and Technological Innovation Consultant at BIOACTIVA Perú.

**Felipe Pilau**, University Professor the "Luiz de Queiroz" College of Agriculture.

**Francisco Jardim**, General Partner at SP Ventures.

**Ingrid Drago**, Strategic Linkage in innovation ecosystems at Bolsa de Comercio de Rosario.

**Joao Roberto Spotti Lopes**, Vice-director at the "Luiz de Queiroz" College of Agriculture.

**Jorge Achata**, Sustainable technology and innovation at BIOACTIVA Perú.

**Leisa de Souza**, Head of Latam na Climate Bonds Initiative.

**Lina Lisbona**, GreenTech Investments at Barn Investimentos.

**Luis Fernando Laranja**, Director Partner at Kaeté Investimentos.

**Marco Fujihara**, Founder Partner at EcoFix Securities S.A. and others/Project Development at Techsocial and Sinai/ESG/Climate Finance Sustainable Finance/Compliance, Integrity and Ethics.

**María José Soler**, COO at Endeavor Rosario / Professor of Business Policy and Entrepreneurship - Universidad Austral - Rosario.

**Sergio Pascholati**, Retired Professor at USP/ESALQ. Partner/Founder/Chairman of the Board at Ideelab Biotecnologia Ltda.

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- (16) The St. Louis Metropolitan Statistical Area (MSA) is a bi-state region encompassing 14 counties and one city. The data shown is drawn from a study conducted by the St. Louis Agribusiness Club in 2020. You can view the report at the following link: <https://stlouisagclub.org/economic-study/>
- (18) Fearnside, P. M. (2005). Deforestation in Brazilian Amazonia: History, Rates, and Consequences. *Conservation Biology*, 19(3), 680–688 <http://www.jstor.org/stable/3591054>
- (19) Source: Inpe/Sistema PRODES  
<https://www.dw.com/es/brasil-registra-deforestaci%C3%B3n-r%C3%A9cord-en-la-amazon%C3%ADa-en-%C3%BAltimos-15-a%C3%B1os/a-59871275>
- (20) <https://radaragtech.com.br/wp-content/uploads/2021/05/Radar-Agtech-Brasil-2020-2021-Embrapa-SP-Ventures-Homo-Ludens-Relatorio-Final.pdf>
- (21) <https://report.startupblink.com/> (22) <https://startupgenome.com/reports/gser2020>
- (23) Source: Universidad Austral <https://www.austral.edu.ar/cienciasempresariales/wp-content/uploads/2021/06/Documento-Final-18-03-2020-1-1.pdf>
- (24) Examples of these initiatives are shown in the comparative table in the "Comparison of the three case studies" section of this document.
- (25) Source: Universidad Austral <https://www.austral.edu.ar/cienciasempresariales/wp-content/uploads/2021/06/Documento-Final-18-03-2020-1-1.pdf>
- (26) The world-renowned University of São Paulo: Luiz de Queiroz School of Agriculture (USP-ESALQ) is ranked fifth in the world in Agricultural Sciences and first in the southern hemisphere, providing the AgTech Valley with intellectual prowess and agricultural research unparalleled in the global south.
- (27) Source: Study.com. "St. Louis, Missouri (MO) Colleges and Universities." Study.com, Study.com, 2018, [study.com/saint\\_louis,\\_missouri\\_\(mo\)\\_colleges.html](https://study.com/saint_louis,_missouri_(mo)_colleges.html).
- (28) Source: The Yield Lab Institute, [https://5fcc053b-615a-436f-9c3b-8151d3b518ff.filesusr.com/ugd/2f4baa\\_a981ee7daf9e472a9036e5abd3edcee6.pdf](https://5fcc053b-615a-436f-9c3b-8151d3b518ff.filesusr.com/ugd/2f4baa_a981ee7daf9e472a9036e5abd3edcee6.pdf)
- (29) Source Universidad Austral <https://www.austral.edu.ar/cienciasempresariales/wp-content/uploads/2021/06/Documento-Final-18-03-2020-1-1.pdf>
- (30) Some of them can be seen in the "Agents" section of this table.
- (31) Definition of "Death Valley" from Investopedia: <https://www.investopedia.com/terms/d/death-valley-curve.asp>
- (32) Some examples are the Industrial, Technological and Foreign Trade Policy (PITCE) of 2004 and the Productive Development Policy (PDP) of 2008.
- (33) AgTech ecosystems at various stages mapped in 2020. Source: Yield Lab Latam
- (34) For more information about interviews, please refer to the Appendix of the document

