RADAR AGTECH LAC 2026

Startups of the Latin American and Caribbean AGRICULTURAL ECOSYSTEM

Realization

SPventures HOMO LUDENS IICA Embrapa

Brazilian Agricultural Research Corporation
Embrapa, Executive Board for Innovation, Business and Technology Transfer
Ministry of Agriculture, Livestock and Food Supply

SP Ventures
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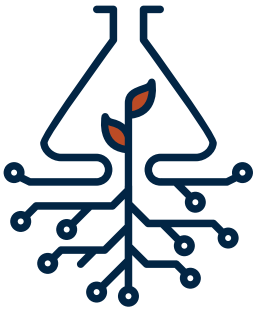

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LAC 2026

Embrapa
Brasília, DF, Brazil
2026

Responsible for content

Brazilian Agricultural Research Corporation
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Ministry of Agriculture, Livestock and Food Supply

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1st edition
Digital publication (2026): PDF

How to cite this report:
FAVARIN, Aurélio Martins; SAKUDA, Luiz Ojima; BERT, Federico (Orgs.). Radar Agtech LAC 2026: Startup Mapping of the Latin American and Caribbean Agricultural Ecosystem. Brasília, São Paulo, San José: Embrapa, SP Ventures, Homo Ludens and IICA, 2026. https://radaragtech.com.br

Message from IICA

Agri-food systems are undergoing a profound transformation driven by advances in emerging technologies, particularly digital ones. Tools such as sensors, artificial intelligence, platforms and applications, data analytics, automation, and smart machinery are redefining the way we produce, process, market, and consume food and other agricultural products. This opens up concrete and powerful opportunities to improve the productivity, sustainability, and inclusivity of agri-food systems.

In this process, Agtech startups have established themselves as central players in the transformation. Many of the new technological solutions entering the agri-food sector today are developed by startupscapable of combining scientific knowledge, technological and business capabilities, and a close understanding of the needs of producers and agri-food supply chains. However, these innovations do not emerge in isolation: they are part of dynamic ecosystems in which research and development institutions, universities, incubators, accelerators, investment funds, public agencies, and private actors interact to create the conditions for their growth and adoption.

At IICA, and as the recent past has shown us, we are convinced that technological innovation is a strategic tool for advancing toward a more competitive and sustainable agriculture that offers greater opportunities for development and well-being for the communities in our region. For this reason, through our Digitalization and Artificial Intelligence initiative, we have been developing actions aimed at strengthening innovation ecosystems, generating strategic knowledge, and promoting the responsible adoption of digital technologies.

The Radar Agtech Latin America and Caribbean represents a significant step in that direction. This publication offers an unprecedented survey and systematization of more than 2,500 Agtech startups in the region, categorized by country of origin, the technologies they develop and the potential benefits generated by their solutions, among other aspects. The study not only allows us to understand and analyze the vibrant progress of Agtech innovation in Latin America and the Caribbean but also to identify and highlight the wide diversity of technologies and solutions currently available to the regional agri-food sector. In this way, the study provides strategic insights to identify trends, opportunities, and challenges, thereby guiding policies and driving the development of ecosystems at both the national and regional levels.

Throughout this process, we particularly value our collaboration with Embrapa, a leading institution in agricultural research and innovation in our region and an undisputed leader in digitalization and Agtech. The experience accumulated by Embrapa through Radar Agtech Brasil, combined with the territorial reach, networks, and work carried out by IICA in agri-food digitalization since 2022, have made this joint initiative possible. We are confident that this report will help highlight the tremendous innovative dynamism of Latin America and the Caribbean, strengthening regional capacities to build the agri-food systems of the future.

Federico Bert - IICA Coordinator for Agri-Digitalization

Message from Embrapa

Radar Agtech LAC: A Strategic Platform for Agricultural Innovation and Entrepreneurship Ecosystem

Brazilian agricultural innovation is at a pivotal point. Digital transformation, artificial intelligence, biotechnology, bio-inputs, sustainability, and new business models are changing the way we produce, share knowledge and generate value in agriculture.

In this context, Radar Agtech LAC has become one of the leading sources of intelligence on the agricultural innovation and entrepreneurship ecosystem in Brazil. Founded in 2019 by Embrapa, Homo Ludens, and SP Ventures as an agtech mapping tool, Radar Agtech LAC has evolved into a strategic platform for knowledge generation, institutional coordination, and ecosystem development.

This evolution addresses the need to transform scattered data on Agtechs, innovation-promoting environments, investors, technologies, and regions into qualified intelligence to guide decisions, investments, public policies, partnerships, and R&D&I initiatives. In a rapidly transforming technological landscape marked by digitalization, artificial intelligence, biotechnology, sustainability, and new business models, the agricultural sector requires tools that can organize information, reveal trends, identify gaps, and connect strategic actors.

Radar Agtech LAC does more than gather information; it reveals trends, identifies gaps, brings strategic actors together, and supports the development of solutions that address the major challenges facing Brazilian agriculture. By doing so, it accelerates innovation in the field, boosts the sector's competitiveness, strengthens technological entrepreneurship, and supports increasingly sustainable, inclusive, science-based agriculture.

The new phase of Radar Agtech is structured around three initiatives: Radar Agtech Brasil, which serves as a national intelligence hub; the Radar Agtech Summit, which serves as an annual forum for strategic discussion and networking among stakeholders; and regional radars, which focus on analyzing state or regional ecosystems. The Radar Agtech LAC aims to integrate Latin America and the Caribbean through a common database, cooperation, and regional visibility.

The 2025 and 2026 editions of the Radar Agtech Summit, held in partnership with Cubo Itaú, represent a milestone in this journey. By transforming mapping findings into a discussion agenda, networking opportunities, and guidance for the ecosystem, the Summit reinforces Radar's role as a convergence space for individuals involved in innovating agriculture. Structuring a new project will accelerate Radar Agtech's transition into a permanent platform for intelligence, connection, and value creation.

This new phase will enable the methodological refinement of mapping exercises, expansion of the database, development of analytical products, and the structuring of regional and international initiatives, and creation of more effective mechanisms for connecting ecosystem stakeholders.

For Embrapa, leading and coordinating this movement is part of its historic mission of putting science at the service of Brazil's sustainable development. Radar Agtech LAC strength-

ens the connection between scientific knowledge, entrepreneurship, investment, public policy, and productive transformation.

Through this initiative, we reaffirm our commitment to a shared agenda of innovation, sustainability, and competitiveness in Brazilian agriculture. At the same time, we are contributing to the expansion of Brazil's presence and leadership in Latin America, the Caribbean, and the world.

Silvia Massruhá
President of the Brazilian Agricultural Research Corporation - Embrapa

Message from Homo Ludens

Radar Agtech LAC: intelligence, methodology, and regional integration for agriculture

Launched in 2019, Radar Agtech Brazil aims to produce systematic knowledge about the agribusiness startup ecosystem. It combines methodological rigor with support for the strategic and operational decisions of entrepreneurs, investors, corporations, researchers, and public policymakers. Since its inception, the project has been a collaboration between Embrapa, SP Ventures, and Homo Ludens, combining expertise in public scientific research, venture capital, and applied knowledge generation. Over the course of the Brazilian editions, the partnership has developed a database, mapping method, and taxonomy that have become benchmarks for the national ecosystem. The Radar Agtech Latin America and the Caribbean (LAC) represents the expansion of this trajectory to the regional scale, reflecting the methodological advancement required by the region's productive, institutional, and territorial heterogeneity.

The main methodological innovation of the Radar Agtech LAC is its classification matrix, which is structured around four complementary analytical dimensions: Production Chains, Technology Domains, Solution Categories, and Benefits. This approach enables the construction of a multidimensional profile of startups by linking the productive sector in which they operate, the enabling technologies they deploy, the typology of solutions they offer, and the benefits associated with their value propositions. For each mapped organization, up to three options per dimension may be recorded and arranged in order of relevance, validated through explicit, verifiable evidence. This arrangement results in a classification structure that is internationally comparable and adapted to the complexity of the region's agricultural production systems, including food chains, agroenergy, fibers, biomaterials, construction, health, and other agriculture-based sectors.

This advancement distinguishes the Radar Agtech LAC from a conventional geographic extension of the Brazilian model. Previous experience provided the methodological framework and the empirical knowledge gained through the partnership between Embrapa, SP Ventures, and Homo Ludens. The international scale required a flexible analytical structure capable of accommodating asymmetries in the maturity levels of local ecosystems, disparities in data availability, and institutional particularities. Thus, the Radar Agtech LAC constitutes a joint evolution of the method geared toward regional comparability and the production of strategic intelligence for various stakeholders in the sector.

This edition mapped 2,653 startups across 23 countries. The results indicate a strong concentration in the Southern Cone, accounting for 90.6% of the total, primarily due to Brazil's substantial share (78.2%). At the same time, a subregional breakdown reveals notable dynamics in the Andean countries, Central America, the Caribbean, and Mexico. Multidimensional analysis shows a predominance of digital solutions and On-Farm technologies but also highlights biological, physicochemical, mechatronic, and biotechnological technologies. These solutions are associated with the following benefits: increased production, improved operational efficiency, strengthened market access, environmental sustainability, climate resilience, product quality, and access to financing. These results demonstrate that the LAC

ecosystem combines regional concentration, technological diversity, and multiple forms of value generation for agribusiness chains.

Latin America and the Caribbean are frequently recognized as a strategic region in international agendas on food security, sustainability, and technological transformation in agriculture. The Radar Agtech LAC documents the active innovation ecosystem within this productive base, reducing information asymmetries and expanding regional visibility to facilitate strategic positioning for startups, cooperation, investment, open innovation, and business development among ecosystem actors.

This edition was developed in partnership with the Inter-American Institute for Cooperation on Agriculture (IICA). IICA's presence and regional reach, combined with its institutional mandate to strengthen agriculture and agricultural production systems in the Americas, expands the project's scope. This collaboration consolidates the Radar Agtech LAC as an intelligence platform focused on regional integration and developing the agribusiness innovation ecosystem in the Americas.

The central objective remains aligned with that of the first edition: providing structured, comparable information to support decision-making, guide strategic connections, and foster coordinated action among ecosystem actors. Given Latin America and the Caribbean's strategic role in the future of agriculture and bio-based value chains, including food, bioenergy, fibers, and biomaterials, Radar Agtech LAC establishes itself as a technical and institutional tool to document capabilities, strengthen connections, and expand opportunities for cooperation, investment, open innovation, and business development.

Luiz Ojima Sakuda
Partner and Co-founder, Homo Ludens Innovation and Knowledge

Message from SP Ventures

Latin America and the Future of Innovation in Agriculture

Latin America boasts one of the world's most significant agricultural sectors. Home to some of the world's leading food producers and exporters, the region boasts immense climatic and biological diversity and plays an increasingly strategic role in discussions on food security, productivity, and sustainability.

In recent years, the region has also begun to emerge as a leader in the innovation landscape. The growth of startups in agribusiness, biotechnology, bio-inputs, agricultural fintech, artificial intelligence, and new field solutions shows that the Latin American ecosystem is entering a new phase of maturity. Rather than simply adopting technologies developed in other markets, the region is developing its own solutions tailored to local characteristics and challenges.

This development comes at a critical moment for the sector. The global venture capital landscape has become more selective, with investors placing greater emphasis on fundamentals, efficiency, and execution capabilities. Nevertheless, agriculture remains one of the most strategic sectors in the long term. Rising global demand for food, coupled with a focus on productivity, traceability, and sustainability, keeps the sector at the center of major economic and technological transformations.

However, there is still a significant gap between the importance of Latin American agribusiness and the amount of capital invested in sector innovation. Latin America receives a small share of global AgFoodtech investments compared to its importance in global agricultural production. This highlights a challenge and a significant opportunity for entrepreneurs, investors, and institutions that recognize the region's potential.

In this context, the Radar Agtech LAC becomes relevant. The project provides an integrated view of the agri-food innovation ecosystem in Latin America and the Caribbean by connecting startups, investors, corporations, universities, innovation hubs, and public institutions. In a fragmented ecosystem, generating quality information and bringing strategic actors together is fundamental to accelerating innovation and development.

At SP Ventures, we have long believed in Latin America's potential to lead the next generation of Agritech. The region boasts productive capacity, applied science, entrepreneurship, and a large-scale agricultural market. We are seeing an increasing number of Latin American companies develop competitive solutions for both their local markets and the international stage.

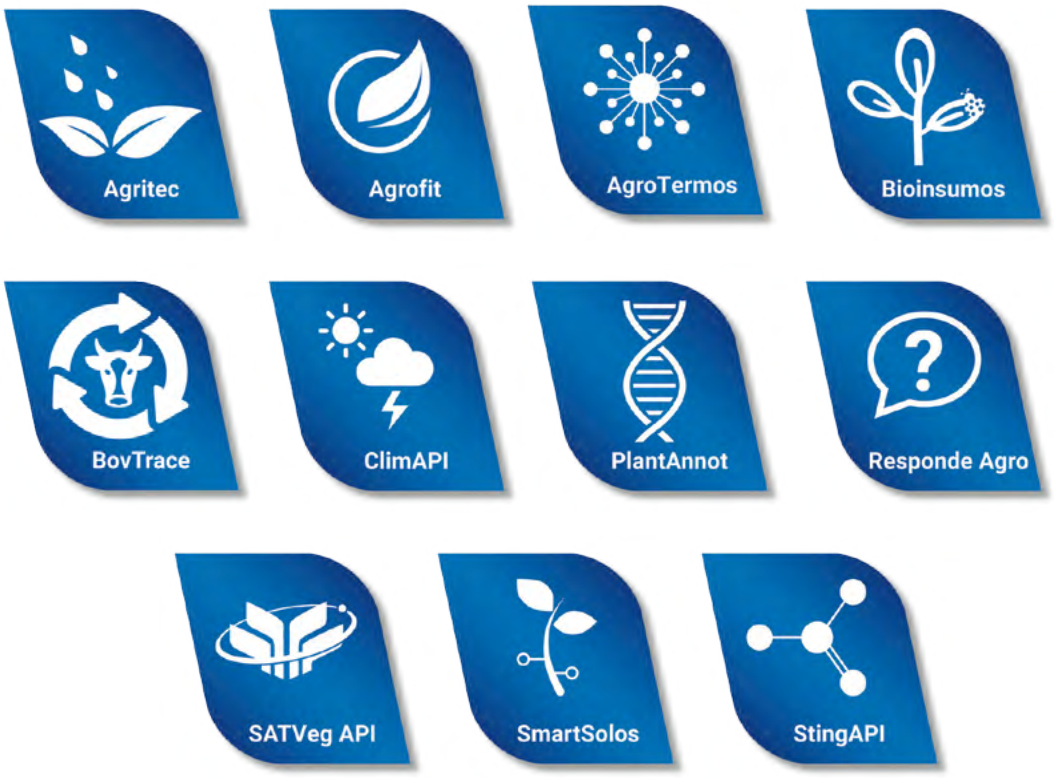
We are proud to publish the Radar Agtech LAC alongside our partners Embrapa, Homo Ludens, and IICA, with whom we share a commitment to strengthening the region's agri-food innovation ecosystem. The project is a direct extension of our mission to develop, foster, and fund technologies, entrepreneurs, and startups with the potential to transform Latin American agri-food chains. The Radar not only expands connections and provides global visibility to the ecosystem but also strengthens a common agenda that places productivity, innovation, and climate sustainability at the center of the region's agricultural development.

We believe that the coming decade will be decisive for establishing Latin America as an agricultural powerhouse and a global leader in AgFood-Climatech innovation. This future depends on the quality of the connections, capital, and knowledge we build today.

Felipe Guth and Francisco Jardim
Partners at SP Ventures

AgroAPI

Embrapa's API platform for the digital AgTech market



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Embrapa

Summary

1. Introduction

• *Aurélio Martins Favarin, Luiz Ojima Sakuda and Federico Bert*

Agricultural innovation is undergoing a phase of profound transformation on a global scale. The convergence of digitalization, artificial intelligence, biotechnology, bio-inputs, automation, connectivity, and new demands related to sustainability is redefining how food, fibers, biomaterials, and energy are produced, distributed, and consumed. In this context, the ability to develop, adapt, and disseminate technologies has become a strategic factor for the competitiveness of agri-food systems and for building responses to challenges related to food security, climate change, and the sustainable use of natural resources.

Latin America and the Caribbean occupy a unique position in this scenario. The region is home to some of the world's largest agricultural powers, holds a significant share of global natural resources, and plays a fundamental role in supplying national and international markets. At the same time, it exhibits great productive, environmental, institutional, and socioeconomic diversity, which creates specific challenges for the diffusion of innovation but also expands opportunities for the emergence of technological solutions adapted to different territorial realities.

In recent decades, there has been a progressive strengthening of agri-food innovation ecosystems in various countries across the region. Startups, universities, research centers, investors, corporations, innovation-promoting environments, and public institutions have come to play an increasingly significant role in the generation and dissemination of agriculture-focused technologies. This movement has been driving the emergence of new technology-based companies capable of operating at different stages of production chains, contributing to gains in productivity, operational efficiency, environmental sustainability, traceability, financial inclusion, and market access.

Despite this dynamism, an integrated understanding of the regional ecosystem still faces significant limitations. Available information is often scattered across different countries, institutions, and initiatives, hindering comparative analyses, the identification of regional trends, and the development of coordinated development strategies. Reducing these information gaps is a fundamental prerequisite for expanding cooperation among countries, strengthening financing mechanisms, stimulating open innovation processes, and accelerating the adoption of technologies on a regional scale.

Within this context, the Radar Agtech Latin America and Caribbean (Radar Agtech LAC) emerged, an initiative developed through cooperation between Embrapa, the Inter-American Institute for Cooperation on Agriculture (IICA), Homo Ludens, and SP Ventures — the partnership was established in 2025, during the 30th United Nations Climate Change Conference (COP30) in Belém, Pará. The project represents the evolution of experiences accumulated over recent years in mapping and analyzing agricultural innovation ecosystems, particularly building on the trajectory of Radar Agtech Brazil, expanding its scope to a regional and international perspective.

The 2026 edition of Radar Agtech LAC presents a mapping of 2,653 startups spread across 23 countries in Latin America and the Caribbean, constituting one of the most comprehensive strategic intelligence databases ever compiled on agri-food innovation in the region.

The results reveal a strong concentration of startups in the Southern Cone, particularly due to Brazil's leading role, but also highlight the growth and diversification of ecosystems in the Andean countries, Central America, the Caribbean, and Mexico.

In addition to identifying the geographic distribution of startups, the study adopts a multidimensional approach based on four complementary perspectives: production chains, technological domains, solution categories, and benefits generated. This framework makes it possible to understand not only where companies are located, but also what technologies they develop, what challenges they seek to solve, and what impacts they may have on the region's agri-food systems.

More than a statistical survey, the Radar Agtech LAC constitutes a regional strategic intelligence infrastructure aimed at connecting knowledge, technology, investment, and development. By organizing information, increasing the visibility of ecosystem actors, and creating a common basis for comparative analysis, the project contributes to strengthening regional cooperation and supporting the development of a shared agenda for innovation, competitiveness, and sustainability. In a context of growing importance of Latin America and the Caribbean for global food production, understanding the dynamics of its innovation ecosystem becomes a fundamental element for guiding public and private decisions and for positioning the region as a key player in the transformation of future agri-food systems.

2. Characterization of Latin America and the Caribbean

• *Aurélio Martins Favarin, Alice Alcântara and Caterina Dalmasso*

Latin America and the Caribbean (LAC) constitute one of the most heterogeneous regions on the planet. Although often treated as a single bloc in economic and geopolitical analyses, the region is home to countries with vastly different territorial scales and productive capacities. According to the Economic Commission for Latin America and the Caribbean (ECLAC), the region comprises 33 countries, distributed across South America, Central America, the Caribbean, and North America. Together, these countries have a population of over 650 million and possess environmental assets that are strategic for global climate balance.

The regional organization typically identifies five major subregional groupings, which we also use in this study. The Southern Cone comprises economies with a strong tradition of agricultural exports, such as Argentina, Brazil, Paraguay, Uruguay, and Chile. The Andean Countries (Bolivia, Colombia, Ecuador, Peru, and Venezuela), on the other hand, share geographic and productive characteristics linked to the Andes Mountains, although they exhibit different levels of economic development and institutional stability.

In Central America, smaller economies predominate, heavily dependent on agriculture, tourism, and international remittances, while the Caribbean exhibits high territorial fragmentation and significant climate vulnerability. Mexico, in turn, occupies a unique position in the regional dynamics due to its economic integration with North America and the size of its domestic market.

Table 1. Population of Latin American and Caribbean Countries

Country	Subregion	Population (millions)
Brazil	Southern Cone	215.3
Mexico	North America	131.9
Colombia	Andean Countries	53.4
Argentina	Southern Cone	46.7
Peru	Andean Countries	34.6
Venezuela	Andean Countries	28.2
Chile	Southern Cone	19.7
Guatemala	Central America	18.6
Ecuador	Andean Countries	18.3
Bolivia	Andean Countries	12.6
Dominican Republic	Caribbean	11.3
Honduras	Central America	10.7

Country	Subregion	Population (millions)
Paraguay	Southern Cone	7.4
Nicaragua	Central America	6.9
El Salvador	Central America	6.3
Costa Rica	Central America	5.3
Panama	Central America	4.5
Uruguay	Southern Cone	3.5
Jamaica	Caribbean	2.8
Trinidad and Tobago	Caribbean	1.4
Belize	Central America	0.42
Bahamas	Caribbean	0.41
Grenada	Caribbean	0.13

This study considers data from 23 countries in Latin America and the Caribbean, which are presented in Table 1. The combined population of the 23 countries is approximately 637 million, and the demographic diversity among the subregions is quite evident, given that the Southern Cone countries have a combined population of 289 million, the Andean countries, 147 million; North America, which includes only Mexico, 132 million; Central America, 53 million; and the Caribbean, just 16 million.

Despite structural differences, there are challenges that cut across virtually the entire region. Social inequality remains high in most Latin American and Caribbean countries, coexisting with economies heavily dependent on *commodity* exports and the volatility of international markets. At the same time, the region possesses comparative advantages that are difficult to replicate in other parts of the world: availability of arable land, abundance of fresh water, biodiversity, and growing capacity for renewable energy generation. This set of factors helps explain why Latin America and the Caribbean are increasingly being viewed as a strategic territory for global food security.

Agriculture and livestock play a central role in this dynamic. FAO data indicate that the region accounts for a significant share of global food exports and is home to some of the world's largest producers of soybeans, corn, coffee, meat, fruits, sugar, and fibers. In several countries, agribusiness represents not only a major economic activity but also one of the primary drivers of job creation, tax revenue, and regional development. Brazil, Argentina, and Mexico play a prominent role in international agricultural trade, while smaller countries have been expanding their presence in niche markets related to sustainable production, specialty coffees, cocoa, tropical fruits, and the bioeconomy.

Table 2. Agriculture's Share of GDP by Country

Country	Subregion	% of Agriculture in GDP
Nicaragua	Central America	17
Bolivia	Andean Countries	13
Honduras	Central America	12.5
Paraguay	South Cone	11.5
Belize	Central America	10.5
Guatemala	Central America	10
Ecuador	Andean Countries	9.5
Peru	Andean Countries	7.5
Colombia	Andean Countries	7.2
Uruguay	Southern Cone	7
Brazil	Southern Cone	6.8
Argentina	Southern Cone	6.5
Jamaica	Caribbean	6.5
Grenada	Caribbean	6
Venezuela	Andean Countries	5.5
El Salvador	Central America	5.5
Dominican Republic	Caribbean	5
Costa Rica	Central America	4.3
Chile	Southern Cone	3.6
Mexico	North America	3.5
Panama	Central America	2.3
Bahamas	Caribbean	1.5
Trinidad and Tobago	Caribbean	0.5

Table 2 shows agriculture's share of Gross Domestic Product (GDP) by country, considering agriculture as a primary activity. It is important to note that 17 of the 23 countries have an agriculture share of GDP exceeding 5%, which underscores the sector's importance to the region. From a global impact perspective, the region includes countries with strong agricultural production that are also major exporters, such as Brazil, Argentina, Mexico, and Colombia.

However, the region's agricultural significance cannot be analyzed solely from the perspective of large-scale production. Family farming remains essential for millions of people, especially in Central America and the Caribbean. According to the Food and Agriculture Organization of the United Nations (FAO), approximately 80% of rural properties in Latin America and the Caribbean are family farms. In many cases, this is the primary source of

income and local food supply. This means that any regional strategy focused on agricultural innovation must simultaneously consider productivity, social inclusion, and climate adaptation.

In recent years, the discussion on innovation in Latin American agriculture has begun to incorporate new elements. The expansion of Agtech, digital agriculture, bio-inputs, traceability, and data-driven solutions is changing the way agri-food systems operate. The region has favorable conditions to become an international benchmark for more sustainable production models, but it still faces bottlenecks related to connectivity, financing, technical expertise, and integration among innovation ecosystems. In many countries, effective solutions remain confined to local markets, failing to achieve regional scale.

This scenario highlights the importance of strengthening cooperation mechanisms among Latin American and Caribbean countries. Although there are relevant initiatives at the national level, regional integration in innovation still progresses unevenly. Often, startups, investors, universities, innovation hubs, and public institutions operate in isolation, limiting the potential for generating collective knowledge and building more robust regional markets. The absence of integrated databases and permanent coordination tools reduces the visibility of existing opportunities in the region.

Building stronger connections between the innovation ecosystems of Latin America and the Caribbean tends to generate impacts that go beyond the technological dimension. Closer ties between countries can accelerate the dissemination of sustainability-focused solutions, expand investment opportunities, and facilitate the internationalization of startups. Furthermore, it fosters the exchange of experiences related to public policy, digital transformation in the agricultural sector, and adaptation to climate change—issues that affect virtually all countries in the region, albeit to varying degrees.

It is precisely in this context that regional intelligence and coordination initiatives gain strategic relevance. The Radar Agtech LAC emerges as a platform dedicated to organizing and integrating information about the Latin American agricultural innovation ecosystem. By connecting startups and innovation, ecosystems the initiative helps reduce information asymmetries and increase the visibility of the various actors within the sector.

More than just a mapping exercise, the Radar Agtech LAC helps build a regional vision for agricultural innovation. In an international context marked by growing pressure on food systems, the need to decarbonize the economy, and the search for more resilient production models, expanding cooperation among Latin American and Caribbean countries is no longer merely an institutional agenda. It has become a strategic imperative for the region to transform its agricultural and environmental potential into effective leadership in the innovation economy.

3. Successful Cases Studies

3.1 Digital Agriculture Week (DAW) as a Catalyst for the Regional Agtech Ecosystem

• *Federico Bert, Carlos Ruiz Macho, Alice Alcántara, Caterina Dalmasso Inter-American Institute for Cooperation on Agriculture (IICA)*

The Inter-American Institute for Cooperation on Agriculture (IICA) is dedicated to stimulating, promoting, and supporting the efforts of its Member States aimed at agricultural development and rural well-being through international technical cooperation of the highest quality. Among the priority areas of its strategic agenda is the digitalization of agri-food systems, driven by the Hemispheric Program for Agri-Food Digitalization.

Within this framework, Digital Agriculture Week (DAW), an annual initiative promoted by IICA since 2022, has established itself as a key platform for stakeholders involved in digital agricultural innovation across the Americas. Beyond highlighting technological advances, DAW serves as a strategic tool to foster knowledge exchange, institutional coordination, and the strengthening of the regional agri-food digitalization ecosystem.

SAD as a Hub and Tool for Strengthening the Agtech Ecosystem in the Americas

The SAD functions as a multisectoral hub connecting Agtech companies, investors, academics, and policymakers. Its value as a tool for strengthening the ecosystem is reflected in the following points:

In its 2025 edition, the event brought together more than 160 people from 20 countries in person, including representatives from national research institutes (INIA), investment funds, universities, and international organizations.

The event's design prioritizes in-person participation and "face-to-face" interaction, using activities such as "speed dating" to create direct links between entrepreneurs and funding opportunities.

Through the "Digital Agriculture Days"— organized by IICA's country offices — the aim is to localize the discussion on digital agriculture, bringing together key actors from local innovation ecosystems and promoting networks and technical cooperation initiatives with direct impact. The initiative is structured as a series of local events culminating in a summit at IICA's headquarters in Costa Rica, strengthening coordination among countries, regions, and headquarters.

IICA envisions this hub as a space for strategic thinking aimed at advancing agri-food digitalization, promoting concrete initiatives and lines of action for the institution and participating stakeholders, with a focus on improving productivity, strengthening food security, sustainability, and the inclusion of the rural population.

A Platform for the Creation and Consolidation of the Agtech Network

The SAD has established itself as a strategic space for the formation of technical collaboration networks, with the Agtech Network of the Americas standing out in particular.

The purpose of this network is to drive agri-food digitalization and strengthen the development of Agtech startups that offer digital solutions for agri-food systems. It currently comprises more than 80 leading Agtechs from 15 countries in the Americas.

In this regard, IICA recognizes that Agtechs are the primary developers of solutions and play a vital role in training producers. Strengthening this sector is essential to harnessing the Agtech potential of member countries.

In the context of the SAD, in 2025, a public call for proposals attracted 142 applications from 23 countries, resulting in the selection of 21 winning Agtechs that were able to present their solutions to the regional ecosystem.

Additionally, during the event, a specific meeting of the Agtech Network was organized with the aim of promoting innovative digital solutions that transform agri-food systems.

Furthermore, the SAD facilitates connections between Agtechs and the INIAs and other public actors to promote technical cooperation initiatives, ensuring that technology effectively reaches the field.

Conclusion

Digital Agriculture Week transcends the format of a traditional event to become a technical policy instrument. By acting as a regional connection hub and as the cradle of the Agtech Network, it enables digital innovation to serve as a concrete tool for sustainable agri-food development in the Americas.

3.2 PROCISUR Protocol for the Verification and Validation of Digital Agtech Solutions: A regional tool to strengthen trust, scalability, and ecosystem integration

● *Calderón, F.; Tallarico, G.; Mondo, V.; Best, S.; Carrillo, H.; Tiscornia, G.; Gianoni, C.*

In recent decades, digital agriculture has become a strategic pillar for increasing productivity, reducing environmental impact, and strengthening the sustainability, traceability, and resilience of production systems. In this context, PROCISUR, created in 1980, established an Agtech working group. PROCISUR brings together the National Agricultural Research Institutes (INIA) of the Southern Cone and IICA under a cooperation agenda focused on agri-food and agro-industrial technological development in the region. As a result of this exchange and regional coordination, the Southern Cone's agricultural digital transformation project for efficient water management advanced in 2024. This project is based on strengthening the

INIAs and public-private collaboration. One of the project's main outcomes is the Protocol for the Verification and Validation of Agtech Digital Solutions. This protocol is designed to standardize evaluation criteria, methodologies, and procedures. The protocol ensures that technologies function as described, adapt to real-world conditions, and build trust among developers, producers, institutions, and other regional Agtech ecosystem stakeholders.

The PROCISUR Protocol for the Verification and Validation of Digital Agtech Solutions was developed to drive the digital transformation of agricultural activity, reduce technological gaps, and promote regional solutions in Argentina, Brazil, Chile, Paraguay, and Uruguay. This initiative is a significant institutional advancement that benefits national Agtech ecosystems and the entire regional network of agricultural innovation and entrepreneurship. Developed by the INIA, the protocol establishes a common framework for evaluating, standardizing, and recognizing the reliability of digital technologies applied to agriculture and livestock in the region. The protocol also addresses a critical gap in the ecosystem by bridging the gap between technological development and effective adoption in the field. Many digital solutions enter the market with promising proposals, yet they often lack independent verification of their performance, applicability, usability, technical robustness, and suitability for real-world production conditions. For producers, this results in uncertainty and technological risk. For startups and development companies, it makes it more difficult to demonstrate value, gain credibility, and access new markets. The absence of common criteria also makes it difficult for public institutions, investors, and corporate partners to compare solutions and develop strategies for support, investment, and scalability.

The protocol's central contribution is the creation of a structured verification and validation process. Verification involves technical analysis of the solution by participating institution specialists, focusing on consistency between the technology's claimed and actual functionality, performance, and reliability. Validation, on the other hand, takes place in the field alongside producers, technicians, and end users to assess the solution's usefulness, understandability, applicability, and suitability for real-world conditions. This distinction is essential because a technology that is technically functional may not necessarily generate practical value in a producer's decision-making or operational processes.

The process covers solutions at the commercial stage and is organized into steps that include participation, application, selection, work agreement, verification, validation, publication, and dissemination of results. This design allows for a combination of technical rigor, user participation, methodological transparency, and institutional recognition. It creates a clear roadmap for evaluating digital solutions in a comparable manner across different countries and production contexts.

The PROCISUR Protocol is more than a technical tool; it is a trust infrastructure for the regional Agtech ecosystem that helps organize the relationship between technological supply and production demand. It reduces information asymmetries and generates qualified evidence on the performance of solutions. For startups and companies, the process provides technical feedback, institutional legitimacy, and greater visibility. For producers and technicians, it provides an independent reference to inform adoption decisions. For investors, accelerators, hubs, innovation ecosystems, and anchor companies, the protocol creates a more objective basis for identifying, selecting, and supporting solutions with greater market potential.

Latin America and the Caribbean have great agroecological, institutional, and productive diversity but also face common challenges such as adapting to climate change and variability, improving water use efficiency, reducing emissions, increasing productivity, including small and medium-sized producers, improving rural connectivity, and digitizing agri-food chains. By establishing shared criteria, the protocol creates a common language among research institutions, companies, producers, and public policymakers. This promotes interoperability, regional recognition of results, and the possibility that solutions validated in one country can be evaluated, adapted, or scaled up in other markets, thereby minimizing duplicated efforts.

INIAs play a particularly relevant role in this process because these institutions have territorial reach, technical capacity, public credibility, experimental infrastructure, and a history of interacting with producers and production chains. By positioning themselves as verification and validation platforms, INIAs act as generators of technology and orchestrators of innovation ecosystems. They connect companies, startups, producers, researchers, extension workers, investors, and governments around specific agricultural sector challenges.

The PROCISUR Protocol is an important reference for mapping agricultural innovation ecosystems in Latin America and the Caribbean. It shows that ecosystem maturity should be measured by more than just the number of startups, investors, hubs, or acceleration programs. It should also be measured by the existence of mechanisms that generate trust, evidence, governance, shared standards, and the capacity for cross-border collaboration. In this sense, the protocol is a fundamental institutional layer that transforms technological innovation into adoption, adoption into productive impact, and local impact into regional opportunity.

In summary, the PROCISUR Protocol for the Verification and Validation of Agtech Digital Solutions is a milestone in strengthening the regional agricultural innovation ecosystem. By creating a collaborative, technical, transparent, and adaptable process, the instrument reduces the risk of adoption, raises the standard of digital solutions, builds trust among stakeholders, and promotes the circulation of technologies in the Southern Cone and potentially throughout Latin America and the Caribbean. The Protocol's relevance lies not in being a mere seal of approval, but in establishing a common foundation for advancing digital innovation in agriculture with evidence, credibility, scale, and regional integration.

Suggested citation: Calderón, F.; Tallarico, G.; Mondo, V.; Best, S.; Carrillo, H.; Tiscornia, G. 2025. PROCISUR Protocol for the Verification and Validation of Agtech Digital Solutions. Inter-American Institute for Cooperation on Agriculture — IICA / PROCISUR. https://www.procisur.org.uy/documento/protocolo-procisur-de-verificacion-y-validacion-de-soluciones-digitales-agtech/

3.3 Farm Labs: Embrapa and partners driving innovation and agricultural entrepreneurship in Brazil

- *Shalon Silva de Souza Figueiredo, Vitor Henrique Vaz Mondo, Aurélio Martins Favarin and Daniela Ferraz Bacconi Campeche*

According to the Legal Framework for Innovation in Decree No. 9,283/2018, innovation-promoting environments are understood as spaces conducive to innovation and entrepreneurship, which constitute environments characteristic of a knowledge-based economy

and bring together companies, different levels of government, scientific, technological, and innovation institutions, development agencies, or civil society organizations (BRAZIL, 2018).

Agricultural innovation requires environments capable of facilitating experimentation, connecting science, infrastructure, real-world production challenges, and ecosystem actors. By establishing farm laboratories and living labs, known as *farm labs*, Embrapa expands the use of its assets within the innovation ecosystem, complementing the capabilities of partners and startups focused on open innovation.

This approach is aligned with Embrapa's 2024–2030 Master Plan, which guides the Company's operations in a context of increasing agricultural complexity and reinforces the need for interaction with the various stakeholders who generate knowledge, technology, and impact. In this sense, farm labs embody Embrapa's role as an entrepreneurial public institution that coordinates and strengthens ecosystems, capable of sharing infrastructure, reducing technological risks, connecting expertise, and creating conditions for innovation to reach production systems with greater quality, scale, and impact.

Furthermore, the establishment and operation of farm labs with Embrapa's participation reinforces the Company's strategic presence in the agricultural innovation and entrepreneurship ecosystem as a driver for strengthening open innovation and is equally supported by Embrapa's Innovation Policy (2018), which establishes, among its guidelines, participation in and the creation of environments that foster innovation, including the sharing of physical, experimental, and technological infrastructure. To illustrate the progress made by Embrapa and its partners in this area, three *farm labs* in which the company participates are presented below.

AgNest

AgNest, located in Jaguariúna, São Paulo, is one of the initiatives that embody this strategy. Structured as the first *farm lab* with Embrapa's participation, it began operations in 2024 and is focused on supporting Agtechs and other innovative companies.

The environment combines a productive farm, shared infrastructure, areas for development, validation, and demonstration of technologies, and interaction with the ecosystem. Its goal is to support the development and validation of solutions, particularly those related to digital and sustainable agriculture.

By bringing startups, companies, institutions, and producers closer to a real production environment, AgNest helps bridge the gap between technological solutions and their effective adoption in the field. This is achieved through field trials, as well as training and other interactions that take place within the AgNest space.

Farm labs under construction: Pecus Lab and Agforest Lab

In this context, and with the aim of expanding the implementation of this strategy, *Pecus* Lab has been established to generate significant institutional benefits, such as attracting partners, raising funds, and increasing visibility within the innovation ecosystem, while also seeking to optimize the use of experimental areas and other infrastructure, reduce operational costs, and potentially generate revenue. Pecus Lab is located in São Carlos, São Paulo, and

is currently being established, with a central focus on the development of sustainable dairy farming.

Another example is AgForest Lab, located in Belém, Pará, conceived as a living laboratory dedicated to innovation in nature-based solutions and the strengthening of scalable agroforestry systems in the Amazon biome. The initiative expands the *farm lab* model into a strategic agenda for the bioeconomy, sustainability, and adaptation to the specific conditions of the Amazon. By combining applied research, validation in a production setting, institutional coordination, and cooperation with partners, AgForest Lab demonstrates how the strategy can be adapted to different biomes, technological challenges, and infrastructure models.

Final Considerations

Innovation-promoting environments involving Embrapa can be understood as institutional mechanisms for reducing uncertainties in the agricultural ecosystem. In a sector marked by biological cycles, territorial diversity, climate risks, regulatory requirements, validation costs, and a strong reliance on producer trust, innovation does not advance solely through the existence of good technological solutions. It depends on evidence, demonstration under real-world conditions, qualified technical mediation, and connections between technological supply, production demand, investors, companies, and public institutions.

By offering experimental infrastructure, scientific knowledge, protocols, networks, and coordination capacity, these environments reduce technological, adoption, market, and scale uncertainties, creating a more secure foundation for solutions to be developed, adjusted, validated, and connected to real-world trajectories of use and expansion. Based on these experiences, Embrapa has been consolidating a scalable approach.

The goal is not to create isolated environments, but to develop an institutional framework for the strategic use of infrastructure, expertise, and networks to support different innovation agendas and ecosystems. This framework can be applied to complementary themes, such as digital agriculture, low-carbon livestock farming, agroforestry systems, bio-inputs, regenerative agriculture, traceability, mechanization, rural connectivity, and technologies for climate adaptation. It can also take different forms, ranging from farm-laboratories and living laboratories to demonstration areas, technology showcases, validation platforms, thematic hubs, and territorial experimentation networks.

This vision aligns directly with the concept of the State as an entrepreneur, facilitator, and enabler of innovation ecosystems. In this role, the public institution acts not only as a funder, regulator, or executor of research, but as an agent capable of driving strategic agendas, mobilizing expertise, reducing risks, creating markets, structuring connections, and guiding innovation processes focused on challenges relevant to society. In the case of agriculture and livestock, this means organizing public and private capacities around themes such as digitalization, sustainability, climate adaptation, the bioeconomy, traceability, sustainable intensification, and the transition to more resilient production systems.

3.4 INIA and Agtechs: Challenges and Opportunities

• *Guadalupe Tiscornia, Ariel Lutenberg, Pablo Gomez, Julieta Lust*

As part of an institutional strategy in AgroTIC (Tiscornia et al., 2023a, 2023b), and as part of the ongoing pursuit of innovation in coordination with various stakeholders in the agricultural and technology sectors, the implementation of a platform for evaluating digital solutions was proposed.

Converge

The Converge Agtech Innovation Platform was formally established in December 2022 through the "Living Lab Uruguay: Validating Agtech Solutions for Greater Resilience to Climate Change" project. This project is co-financed by IDB Lab, the innovation laboratory of the Inter-American Development Bank (IDB) Group, and the National Institute of Agricultural Research of Uruguay (INIA). It is also supported by Uruguay's National Agency for Research and Innovation (ANII) (Tiscornia, 2023; Lutenberg et al., 2024).

Through the coordination of public-private efforts, this project proposes an initial pilot to verify, validate, and disseminate digital technological solutions focused on the sustainability and climate change resilience of production systems. The pilot emphasizes small and medium-sized agricultural producers in Uruguay (Tiscornia, 2023; Lutenberg et al., 2024).

Converge is a space where innovators, producers, and specialists collaborate to develop digital solutions that address climate change challenges in the region. Aligned with the global trend of rural digitalization, this initiative seeks to address the global issue of climate change. To this end, the project aims to promote the development and adoption of digital solutions that increase resilience to climate change. These solutions include:

- The implementation of automation in water management for irrigation and livestock watering systems.
- Optimizing herbicide use through selective application based on weed recognition.
- Monitoring various variables (e.g., soil moisture content, temperature, rainfall, and wind speed) using sensors to aid in decision-making for agricultural applications and irrigation.
- Automation in greenhouses (e.g., opening ventilation or shade) based on environmental conditions inside the greenhouse.
- Digital data logging systems automatically visualize the evolution of certain variables (e.g., pasture growth).

Digital solutions often offer novel approaches to problem-solving, but they are frequently unfamiliar to producers and technicians. One reason producers make limited use of these solutions is fear of "technological risk"; many prefer to continue their activities as they have always done or use only the most familiar methods rather than adopt unfamiliar technologies. Supporting the cultural and technological changes involved in managing production systems is a key area where we at INIA aim to make an impact.

The process begins when companies or startups submit their developments. A committee of experts then preselects technologies based on environmental impact and commercial

maturity. INIA experts evaluate these preselected solutions (a process we call technical verification of the digital solution to confirm its performance), and we assess usability aspects with producers or other users (a process we call validation to verify whether the solution is clear, useful, and easy to use). Once they successfully complete this process, they receive the Converge seal. The evaluation results are available on the website https://inia.uy/converge, and the solutions are added to a list that will be promoted on the website, social media, and at INIA events. Additionally, some of these digital solutions are installed at INIA experimental stations to remain accessible to producers, investors, and specialists. Once the solutions successfully pass this verification and validation process, it is expected that producers and technicians will be provided with the appropriate information to help reduce the risk of adoption.

Furthermore, when solutions proposed by startups and companies obtain the Converge seal, they become eligible for contingent financing managed by INIA to implement improvements in functionality, visualization, marketing, usability, and other areas that may arise from the verification and validation process.

It is worth noting that some of these companies or startups have continued collaborative efforts based on the relationships and trust built. This leads to the incorporation of new features, specific studies, or the co-development of innovative solutions. Additionally, interesting interactions have emerged with entrepreneurs during the ideation stage through the incubators, who often require a connection to the agricultural sector.

Currently, we are working with over 55 companies, 20 of which already hold the Converge seal (Lutenberg et al., 2026). We understand that Converge helps bridge the gap between technological supply and productive demand, reducing the risk of adoption and fostering informed investments.

Regional Integration: PROCISUR and the V&V Protocol

The first step toward achieving regional integration of these types of initiatives is to collaborate and coordinate with other research institutes. In this regard, work is underway within the PROCISUR framework (Cooperative Program for Agri-Food and Agro-Industrial Technological Development in the Southern Cone) in collaboration with Embrapa (Brazil), INIA (Chile), INTA (Argentina), and IPTA (Paraguay). The project, "Digital Transformation in Southern Cone Agriculture for Efficient Water Management through the Strengthening of INIAs," is underway (https://www.procisur.org.uy/documento/protocolo-procisur-de-verificacion-y-validacion-de-soluciones-digitales-agtech/).

The project aims to strengthen the regional Agtech ecosystem, identify areas of action for the INIAs within it, develop a standardized verification and validation protocol, and contribute to the regional integration of relevant Agtech information.

To standardize and scale up verification and validation processes regionally, the INIAs of the Southern Cone, together with PROCISUR and IICA, drew on their national experience to develop the PROCISUR Protocol for the Verification and Validation of Agtech Digital Solutions in 2025 (Calderón et al., 2025). The process covers solutions in commercial stages (TRL ≥ 7) and consists of eight phases: participation, application, selection, work agreement, verification, validation, publication/dissemination, and the V&V Seal. The PROCISUR Protocol aims to contribute to the development of the regional Agtech ecosystem by ensuring reliability,

transparency, and scalability while promoting interoperability and regional recognition of results. The coordination between these two instruments enables the "Converge Seal" and the "V&V Seal" to be based on shared criteria, which facilitates their use and dissemination across different countries.

Final Comments and Reflections

Through the V&V protocol of Converge and PROCISUR, INIA aims to strengthen the national and regional Agtech ecosystem by reducing uncertainty and improving the technical quality of digital solutions. This mechanism aims to accelerate the adoption of digital solutions in agriculture and contribute to economic, social, and environmental aspects through interoperability and a trust framework for producers and technicians.

To address current Agri-ICT challenges, INIA will strengthen its internal structure and optimize its ties with the private sector to capitalize on synergies and avoid duplicating efforts.

The ultimate national goal is to lead a digital transformation in agriculture that optimizes processes and ensures a positive, sustainable impact on the country's development. This goal is projected at the regional level through partnerships and coordinated efforts with various institutions.

3.5 The Agtech Ecosystem in Argentina

- *Gabriela Tallarico and Facundo Calderón*

Argentina's Agtech ecosystem is dynamic and growing. It has the capacity to develop cutting-edge solutions and products. The sector is comprised of passionate entrepreneurs, a robust scientific and technological system, and highly innovative producers.

We are **developing, adopting**, and **connecting** an innovation infrastructure to support the growth of the Argentine agricultural sector.

Sustained growth

Argentina's Agtech ecosystem is a dynamic and growing sector comprising over **400 startups** linked to a robust public science and technology system. New entrepreneurs and traditional agribusiness companies are joining forces with digital platforms and solutions alongside a network of accelerators and investment funds that foster synergy and growth. Notably, Argentine producers have a longstanding interest in optimizing their processes by "producing more with less" and are quick to adopt new technologies.

Over the past decade, the Argentine Agtech ecosystem has experienced sustained growth, standing out for its diversity of players and technological solutions, as well as its growing degree of internationalization. This synergy among stakeholders has been crucial in increasing the number of Agtech startups from 120 in 2021 to 380 in 2025.

These startups primarily serve the domestic market, though a growing segment is focused on exports and international expansion. A significant opportunity for Argentine Agtech companies is achieving regional scalability, which would enable them to supply not only local producers, but also export digital technologies and transform the industry.

An Overview of Innovation: What Solutions Does Argentina Offer?

Of the 380 Agtech companies surveyed, 25% provide solutions for extensive precision agriculture production. This reflects the importance of this agricultural activity, which is concentrated in the provinces of the core region.

The other major segment of technology offerings consists of biotechnology companies (15%), followed by companies dedicated to livestock solutions (11%). Marketing platforms (8.9%) and management and agri-finance platforms (8.6%) are the digital services with the highest share of participation in the ecosystem.

The available technological proposals contribute to three areas of intervention[1]:

- **Pre-Farm (planning and management)**, Argentina has digital solutions for marketing, production planning, and management; financial and business management platforms; and comprehensive platforms for capturing and managing climate, production, and environmental data. These platforms are now the key to integrating the entire precision agriculture cycle and making decisions.
- **On-Farm (after the farm gate)**, producers are most familiar with adopting technology. In addition to the technological offerings provided by agricultural machinery itself, it is important to acknowledge the many possibilities made possible by digitalization. These range from variable-rate application systems and selective application with microenvironmental control and field segmentation to IoT devices for continuous data capture. The rapid adoption of drones is a defining feature in various production regions, including growing cereals, oilseeds, tobacco, sugarcane, vineyards, and fruit orchards.
- **Post-Farm,** we can showcase a thriving ecosystem in terms of the quantity and variety of products and solutions offered by Agtech companies in Argentina. These include applications for logistics, traceability, inventory management, and B2B platforms, as well as asset tokenization, smart contracts, and the simulation of specific environments.

Distributed Knowledge Geographic

One of Argentina's distinctive strengths is that innovation is distributed across regional hubs that combine agro-industrial density, academic talent, and technological capabilities, rather than being centralized in a single capital city. The main innovation hubs are:

- **Buenos Aires City (CABA)**: It is home to a significant number of companies and functions as a center for software management and development.
- **Rosario (Santa Fe)** is the country's main agro-export hub with strong institutional coordination.
- **Río Cuarto (Córdoba):** It has a diverse ecosystem, a strong academic system, and the presence of multinational technology companies.
- **The Province of Buenos Aires:** It has hubs in Tandil, Mar del Plata, Bahía Blanca, and Pergamino that integrate academic, research, and business capabilities.
- **Mendoza:** A vibrant hub for technology initiatives and innovation to promote regional production.

Implementation: training and promotion of adoption

The success of these technologies would not be possible without the Argentine producer's culture, which has historically focused on optimizing processes based on the idea of "producing more with less."

However, the adoption of technology shows a duality. Precision agriculture tools, such as yield monitors, autopilot, satellite-guided planting, and seeding monitors, have been widely adopted. These tools were the hallmarks of the first major boom in Agro 3.0.

Conversely, digital agriculture technologies (the 4.0 paradigm), such as agricultural management platforms, real-time monitoring, and data integration, are in a phase of gradual expansion that should accelerate.

Training initiatives, field days, and demonstration events organized by INTA Argentina at its regional offices and through the nationwide Agtech Program exemplify how access to knowledge about technologies and their applications catalyzes the adoption of digital solutions.

Interacting: Connections That Add Value

The growth of the Agtech sector depends on technological developments and the willingness to combine **knowledge, resources, and stakeholders**.

Several authors (Friedrich List, 1982; Freeman, 1998; and Lundvall, 2010) agree that innovation is fundamentally a social process. They also agree that an organization's capacity for innovation largely depends on the system in which it operates and the environment in which its agents function. By extension, this also applies to the territory as a whole. From this perspective, we are interested in analyzing the knowledge infrastructures that shape the agrotechnology environment. Argentina possesses several strategic advantages in this regard: the capacity to generate science-based innovations, internationally recognized technical talent, applied knowledge to enhance competitiveness, and an emerging local ecosystem with global success stories.

The urgency of the transformation needed to support Agri 4.0 leads us to consider innovation in a broader sense, incorporating not only R&D (searching and exploring) but also the productive structure, social actors, and learning processes (doing, using, and interacting) based on knowledge. This approach generally has a different foundation than traditional science.

Agtech companies collaborate with other stakeholders in the ecosystem. These generally include non-governmental organizations, such as universities, civil society organizations, technology centers, and public agencies. They seek to validate and refine their proposals with these organizations. INTA is one of the most frequently mentioned organizations in all national surveys conducted in the sector. It stands out for its extensive reach and presence across the country, as well as its ability to provide services and infrastructure to companies free of charge, and its commitment to technological change.

Another characteristic of this group of emerging companies and tech SMEs is their involvement of new professional profiles ranging from data scientists and computer scientists to experts in the Internet of Things and artificial intelligence. This group also includes a significant number of individuals from the academic sector, as well as promotion and acceleration entities.

The network of actors in the innovation ecosystem also includes:

- **Scientific and Technological Institutions:** These institutions form the foundation of the ecosystem by contributing human capital and technical expertise. One notable institution is the National Institute of Agricultural Technology (INTA). Through its Agtech Program, created in 2022, INTA coordinates resources, validates technologies, and provides training to promote adoption and bridge the digital divide. INTA positions itself as a key facilitator. INTA's Innovation Nodes (NI), a network of five incubators spanning the country's macro-regions, are also noteworthy. The NI aims to foster the growth of tech- and climate-smart companies by investing directly in agri-bioindustrial SMEs.
- **Other notable institutions:** include the National Scientific and Technical Research Council (CONICET), the National Commission for Space Activities (CONAE), and the National Meteorological Service (SMN). Additionally, technology hubs managed by provincial governments promote and create spaces for interaction among the various ecosystem actors.
- **Startups and companies.** As mentioned in the first section, are the driving force behind the development of solutionS that span all stages of production. Examples include Auravant (management platforms), Kilimo (water management), Agrotoken (agrifintech), Plantium (precision agroparts), Origino, and Tracestory (traceability).
- **Incubators and accelerators:** They provide strategic support, training, and access to financing. Key players include Grid Exponential (GridX), The Yield Lab Latam, CITES, SF500, Innventure, and INTA's Innovation Hubs.
- **Venture capital funds:** provide capital for scaling up companies. They provide capital for companies to scale up. Notable funds include Glocal, Kamay Ventures, NXTP Ventures, and Draper Cygnus.
- **Producer Organizations:** They promote the ecosystem by connecting producers to facilitate technology adoption. Examples include: Examples include Aapresid, Sociedad Rural Argentina, and CREA.

Focus on regional expansion

In the face of increasingly complex agricultural management and tight margins, **technology is not just an option, it's a strategic imperative**. Innovation does not happen spontaneously. It requires ecosystems to drive, validate, and scale it. Exponential technologies are radically transforming production methods. Those who manage these technologies with a forward-looking vision will thrive, while those who do not will be left behind.

The commitment of all stakeholders is essential to driving action. There is much work left to do, but we are convinced that **the question is not whether to adopt technology, but rather which technologies to adopt and how to do so strategically to increase farm profitability.**

The future of Argentine agriculture is being written today in every monitored plot of land, every soil-regenerating bio-input, every startup using artificial intelligence to solve production problems, and every farm seeking to improve water efficiency. We are convinced that we can lead this transformation and create the conditions necessary for it to happen collectively.

Argentina's Agtech ecosystem has evolved from a promise to a thriving reality. It is a dynamic, growing sector driven by cutting-edge development capabilities, a robust scientific and technological system, and fundamentally, highly innovative producers.

With an eye toward regional expansion, Argentina has successfully built a unique infrastructure for innovation that stands as a benchmark for the future of agriculture today.

3.6 INTA Drone Network: Strategy, Data, and Synergies for Argentine Agriculture

- *By Gabriela Tallarico, Emanuel Visentini, and Facundo Calderón*

The use of drones, also known as unmanned aerial vehicles (UAVs) or remotely piloted aircraft (RPAs), in agriculture is no longer novel but has become an established precision tool. This technology complements existing machinery, enhancing agronomic decision-making.

In this context, INTA's National Agtech Program spearheaded the creation of the **Drone Network,** an initiative that focuses on generating quality data, scientifically validating field trials and tests, and exploring technical applications in various environments.

Operational Capacity and Strategic Objectives

INTA's Drone Pilot Network was established to organize and optimize the institution's equipment and human resources. Currently, the network has significant critical mass: over **65 researchers involved in 20 research lines** and a team of **22 licensed pilots** working across the country.

The Network's primary purpose is to leverage these institutional strengths to coordinate with product and service providers, aerial applicators, and producers evaluating the possibility of incorporating this equipment to **accelerate its adoption.**

First and foremost, the Network aims **to collect and leverage data** to create more accurate predictive models. This involves more than just "going out and flying"; it also requires

processing complex agronomic information, incorporating relevant data into **scientific research**, conducting continuous monitoring, and obtaining real-time records by leveraging the full potential of current drone capabilities. INTA also conducts trials and validates results obtained in various testing environments.

Second, the Network believes that technologies are neither good nor bad, but rather that users must be educated and trained to make the most appropriate use of each resource. Through its extension agencies, experimental stations, and the distance learning division, PROCADIS, the Network has conducted more than 30 field workshops, virtual training courses, and webinars. It has also participated in five major national agricultural expos. The Network also serves as a constant source of support and consultation for producers.

The Network also promotes safety and good agricultural practices (GAP) when using RPAs. This is crucial when regulations are evolving. For example, the Argentine Civil Aviation Regulations (RAAC 100-101-102) require a professional and legal approach that differentiates between open, specific, and certified categories based on the weight and risk of the operation.

Technological Applications and Research Areas

INTA deploys drones in many ways that extend far beyond the application of pesticides. Their **research** stands out in **various disciplines** and production sectors, including forestry, industrial crops, extensive agriculture, livestock, and viticulture.

In **extensive agriculture**, for example, the equipment is used for phenotyping varieties of crops such as cotton and sunflowers, for high-throughput phenotyping to estimate soybean height, and for precision agriculture through geomatics and environmental microsegmentation. It is also used to conduct trials to evaluate pesticide application efficiency and drift.

Thermal and multispectral cameras allow for rapid, accurate monitoring of canopy characteristics. Using vegetation indices such as NDVI and SAVI, researchers can measure biomass, count plants, and detect water stress by monitoring crop temperature.

In **plant protection**, drones facilitate the early detection of diseases in intensive crops such as olives, tobacco, grapes, and peaches. This enables proactive decision-making in response to health issues.

Studies are also being conducted on **forest** surveys, the restoration of burned forest areas, and the management of native forests.

The Network's versatility extends to **livestock farming** and **natural resource management** as well. Research lines are being developed to assess pastures and grasslands, count and track herds, and locate native wildlife such as guanacos and llamas. Furthermore, in the face of climate change, this technology is essential for managing risks, as it enables the assessment of damage caused by extreme events, such as floods, droughts, fires, and hail. It also allows for the hydrological modeling of complex environments.

Public-private collaboration as a driver of innovation

Accelerating the adoption of technology always requires a dynamic approach, public-private partnerships, and collective training initiatives to democratize meaningful access to new, productive tools.

The Network has formalized agreements and initiatives with key stakeholders in the sector, including the Argentine Federation of Agricultural Aviation Chambers (FEARCA) and the Chamber of Agricultural Health and Fertilizers (CASAFE). The Network also coordinates academic initiatives with the National University of Rosario and the National University of Córdoba. These partnerships enable training in not only equipment operation, but also knowledge of processing software, best practices, and testing protocols. One of the distinguishing aspects where true added value often lies is agronomic analytics related to the use of drones, an invaluable contribution from INTA.

As a milestone of this collaborative strategy, INTA co-organized the **2025 International Drone Symposium** with the Rural Society of Tucumán and several partner companies. The three-day Symposium brought together over 200 participants and 26 national and international speakers to discuss topics related to all aspects of drone use, ranging from calibration and flight planning to targeted uses, applications, air governance, current legal regulations, and the implementation of computer vision algorithms. The plan for continued growth is already underway. The goal is to establish the **2026 International Drone Congress** as the premier event for the industry in the Southern Cone.

Ultimately, INTA's Drone Network aims to be a technical and scientific leader. Through trial validation and strategic partnerships, the network seeks to ensure that technology reaches producers efficiently, safely, and sustainably.

3.7 Smartfield INIA Chile

Chilean agriculture is undergoing rapid transformation due to the expansion of high-value crops, rising production costs, increasing water scarcity, and climate change impacts. Meanwhile, new technologies such as sensors, digital platforms, artificial intelligence, satellite imagery, and smart mechanization have emerged and offer opportunities to improve efficiency, productivity, and sustainability. However, the adoption of these tools faces several structural barriers, including low digital literacy, limited interoperability between solutions, a lack of connectivity in rural areas, and, most notably, an absence of demonstration sites where digital tools can be tested under real production conditions.

Despite the growing supply of digital technologies, producers continue to struggle to understand, evaluate, and implement advanced tools. The mismatch between the supply of technology and the capacity to adopt it led to the creation of an initiative that integrates knowledge, field validation, training, and public-private collaboration. In this context, SmartField INIA was established to bridge technological gaps and promote the modernization of the agricultural sector by validating digital technologies, building capacity, and collaborating with Agtech companies. This enables producers to view these technologies as simple, reliable, and scalable tools that can reduce uncertainties in the industry.

The Initiative

SmartField INIA is a public-private collaborative ecosystem integrating applied research, technology validation, training, and digital transfer. The initiative aims to accelerate the adoption of technologies that allow small, medium, and large businesses to incorporate Agriculture 4.0 tools into their management decisions. This initiative is organized through

a network that includes INIA's experimental centers in Santa Rosa and Los Tilos, as well as national and international technology companies, innovative producers, public institutions, and teams that specialize in irrigation, remote sensing, and digital management.

The SmartField model is based on three pillars: validating technologies in controlled environments and on real farms through rigorous protocols, generating agronomic and economic evidence on the impact of digital solutions, and improving agricultural digital literacy through training, supported pilot projects, and simple, end-user-oriented tools. This approach reduces uncertainty for producers and companies, facilitates scaling solutions, and builds a bridge between research and technology adoption at the farm level.

How does it work?

SmartField has implemented an applied innovation model combining experimental validation zones and pilot projects on farmers' properties across the country. This setup enables the observation of IoT sensors, weather stations, artificial intelligence algorithms, digital irrigation systems, drones, and smart mechanization in real-world conditions that incorporate climatic, edaphic, and operational variability.

One of the most significant advances has been the validation of water management systems that use soil moisture sensors and data analysis. These sensors are installed at points defined by environmental maps created using multitemporal satellite data, electrical conductivity analysis, and topographic zoning. The obtained data feeds a digital platform developed by INIA that simplifies the interpretation of water status via a traffic light visualization indicating whether the crop has excess, sufficient, or insufficient water. An artificial intelligence module is also added to the platform, capable of sending automated recommendations via WhatsApp, indicating when and how much to irrigate. This approach enables farmers with no digital experience to use advanced technology without requiring complex training.

Results and Lessons Learned

The implementation of SmartField in various regions across the country has shown that digitalization can transform agricultural management when paired with technical support and user-centered design. A key achievement has been establishing a validation model under real-world conditions, enabling farmers and technology companies to evaluate the performance and usability of various tools. This has bolstered confidence in innovation and fueled the adoption of new technologies, particularly in critical areas such as irrigation, nutrition, monitoring, and mechanization.

Fieldwork has also demonstrated direct improvements in production efficiency and sustainability. Integrating IoT sensors with simple, AI-powered platforms has optimized water management, while the use of computer vision and variable-rate application has reduced agrochemical use. Multitemporal satellite analysis has also enabled more precise management and sampling decisions. Taken together, these experiences show that technology adoption accelerates when solutions are understandable, reliable, and seamlessly integrate into farmers' routines.

Impact

SmartField INIA is a leader in validating and adopting digital technologies for the Chilean agricultural sector. Its integrative approach combines technical rigor, applied innovation, and on-the-ground support. This approach has proven that digital agriculture is an effective tool for overcoming productivity, sustainability, and competitiveness challenges. Through its collaborative model, SmartField has bridged technological gaps, facilitated access to advanced tools, and strengthened Chile's agricultural innovation ecosystem. In an era of indispensable digital transformation, SmartField is a key catalyst for more efficient, intelligent, and resilient agriculture in the Southern Cone.

3.8 Agroadvance

• *Pedro Jábali, João Paulo Marchesan and Felipe Guth*

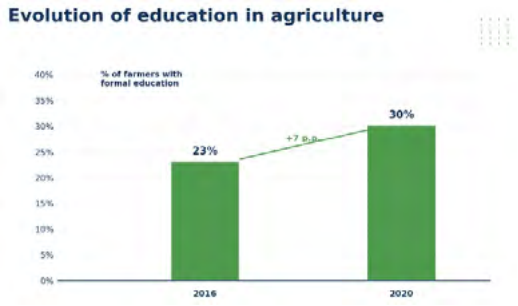
Vertical EdTech for agribusiness: human capital as the engine of competitiveness

Piracicaba (SP), Brazil • Operations in Brazil + 7 countries • Sector: EdTech / Agricultural education

History

Agroadvance was born in **Piracicaba (SP, Brazil)** — one of South America's leading Agtech hubs, alongside ESALQ/USP — to tackle one of the structural bottlenecks of Brazilian agribusiness: the shortage of qualified professionals. It built a **continuing education platform (lifelong learning)** verticalized for the entire agricultural value chain — producers, agron-

omists, consultants, young professionals and large corporations. Today it counts strategic partners on its cap table such as **SLC Agrícola** (the largest publicly listed farm operator in Brazil) and **Ânima Educação Ventures** — one of the country's largest higher-education groups — in addition to a board strengthened by an independent member from **Inteli** (the "Brazilian MIT"). Recognized by HolonIQ as a reference in innovative agribusiness education for **Latin America**, it today reaches all 27 Brazilian states and is expanding into other countries in the region, such as Colombia, Bolivia, Paraguay and Argentina, among others, carrying agronomic knowledge and the strength of Brazilian agribusiness beyond its borders.



Market of operation

Latin American agribusiness is one of the most knowledge-intensive sectors in the world. But **productive capacity is distributed across rural regions**, while quality education remains concentrated in large urban centers. That gap fuels a persistent **rural brain drain**: young talent that migrates to study rarely returns. Agroadvance attacks that bottleneck by bringing high-quality education — from the MBA to the technical course — directly to where agriculture produces.

Educational platform and portfolio

An **integrated portfolio of educational solutions** — from quick learning to the regulated degree, from the individual to the corporate area — supported by an **applied, project-based methodology**, combining rigorous technical content with real case studies and hands-on field experiences. The star of the portfolio:

MBA
& Regulated graduate programs

MBA & Regulated graduate programs *| The backbone of the portfolio*

Programs **accredited by the MEC** — developed with the support of Ânima Educação Ventures and with hands-on experiences at SLC Agrícola farms — that bring **high-value-added training to field professionals without forcing them to migrate to urban centers**. It is the most premium segment of the portfolio and the one that anchors Agroadvance's entry into the verticalized higher-education market for agribusiness.

Rest of the portfolio. Short technical courses, **Expert** programs (professional intensives), **subscription platform** (lifelong learning), and **B2B corporate training** — designed to serve everyone from the individual producer to large agricultural companies that need continuous upskilling of their teams.

Growth figures

+177%	7,000+	27 + 7	CSAT >98%
YoY revenue growth (Nov 2025)	Students trained since the investment	Brazilian states and countries reached	Consistent student satisfaction

Why it matters. Agroadvance modernizes the **human capital of Brazilian agribusiness** — bringing quality education directly to the field, without talent having to migrate to the city to grow.

3.9 Blooms

- *Vanessa Bello, Pedro Jábali, João Paulo Marchesan and Francisco Jardim*

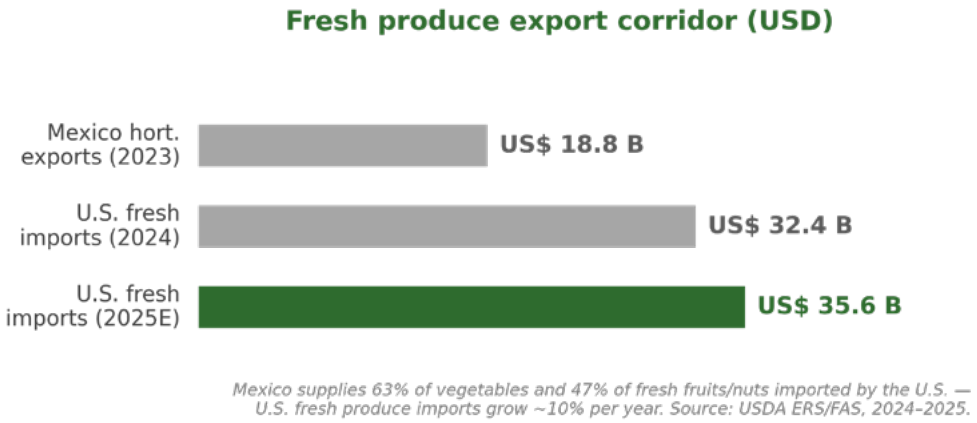
AgFintech for trade finance, payments and FX for fruit and vegetable exporters
Mexico City, Mexico • LatAm → U.S. / Canada corridor • Sector: AgFintech / Trade Finance

History

Blooms was born in Mexico with a clear thesis: the fruit and vegetable export corridor between LatAm and North America is financially broken. Mid-sized growers and exporters lack working capital, cross-border collections and competitive FX. Blooms emerges as **embedded financial infrastructure** for that corridor: it advances capital, enables payments and turns invoice flow into a growth lever. In May 2025 it closed a **US$2.6M seed round led by SP Ventures**, with Angel Ventures, The Yield Lab Latam, Eqwow Ventures, Glocal and Mercy Corps Ventures.

Market

According to the USDA, Mexico exported **US$18.8 billion in horticultural products in 2023**, almost entirely to the U.S. and Canada, supplying **63% of vegetables and 47% of fresh fruits/nuts** imported by the U.S. Total U.S. fresh produce imports would reach **US$35.6 billion in 2025 (+10%)**. But the chain is fragmented: **working capital** and **cross-border collection risk** are recurring bottlenecks. Blooms sits at the heart of that gap.



Portfolio and technology platform

Blooms runs a **trade finance platform for exporters** with four pillars: **working capital**, **factoring / invoice advance**, **cross-border payments** and **embedded FX**. Its moat is **data + AI**: it was selected by Google GDE Americas for a "Trustable AI" architecture that automates underwriting, factoring/FX and supply-chain telemetry. The product that best captures this approach:

Export Copilot *| AI + data at the exporter's service*
An **AI agent** that integrates **pricing, risk, FX and logistics** into a single operational flow. Built with **Google Developer Experts (GDE) Americas** under a "Trustable AI" architecture, it marks the shift of AI from feature to **operational scale layer** across underwriting, factoring/FX and supply chain.

Regionalization · the LatAm → North America corridor

Blooms was built on the region's main agri-export corridor: **Mexico → U.S. / Canada**, the largest fresh-produce flow in the hemisphere. Although it serves the exporter, the impact reaches the grower: more liquidity improves their **cash timing and bargaining power**, sustains **purchase continuity** with small producers and enables **certifications, traceability and cold chain** that open access to more sophisticated value chains. The model is replicable to other corridors and LatAm markets, consolidating a regional financial infrastructure for export agriculture.

Growth data

US$2.6M	US$5.4M	US$10M+	US$3M
Seed round (SP Ventures lead)	Revolving disbursements in 2025	Committed facilities	Revolving line

Why it matters. Blooms is a "connector" of capital and trade: it integrates underwriting, payments and FX in the fresh-produce export corridor. The competitive frontier is shifting toward **infrastructure + data**, and for SP Ventures it represents a clear path to product expansion and moat-building from real transactions and risk.

3.10 Gênica

Agricultural biotechnology for climate-resilient, regenerative systems

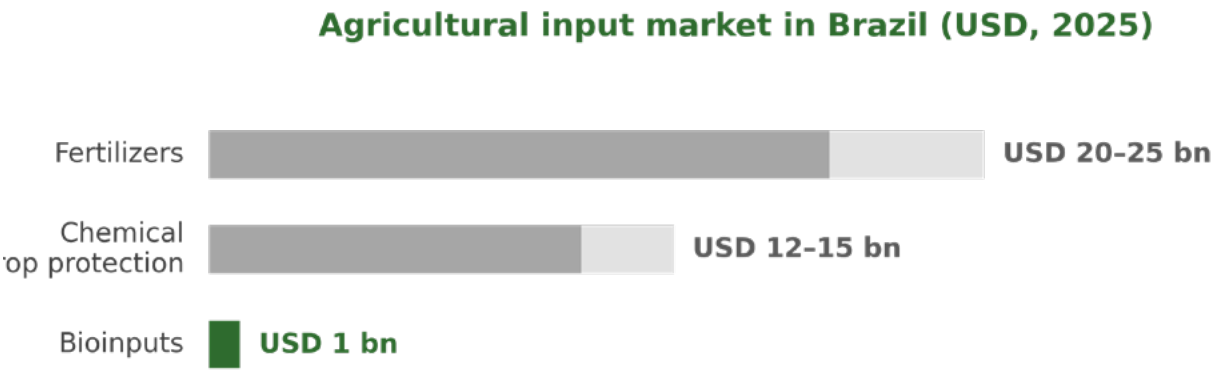
Piracicaba (SP), Brazil • Brazil · Paraguay · Central America • Sector: Bioinputs / Biotechnology

History

Gênica was born in the **Piracicaba Technology Park (SP, Brazil)**, one of South America's leading Agtech hubs, alongside ESALQ/USP. From the start it was built with a vertically integrated R&D core: its own laboratory, an exclusive microbial strain bank and experimental fields across different agricultural regions. Today it has a group of reference investors — **Mosaic, Mitsubishi, Banco do Brasil (Vox), SP Ventures, Baraúna**, among others — and a board with former sector CEOs (CTC, Monsanto) that underpin a track record of **12x revenue growth over the last 6 years**.

Market

Brazil's agricultural input market is structured in three blocks: **fertilizers (USD 20–25 bn)**, **chemical crop protection (USD 12–15 bn)** and **bioinputs (USD 1 bn in 2025)**, which have already surpassed that mark across LATAM. Although biologicals represent only a fraction today, they are growing double digits and some experts project a **50/50 balance with chemicals in the near future**. Gênica is at the heart of that movement.



Bioinputs have already surpassed USD 1 bn in LATAM and keep growing double digits — experts project a 50/50 future against chemicals.

Portfolio and technology platform

The company runs a bioinputs platform focused on products with **high formulation complexity, exclusive strains and proprietary technology**. **Gênica's core is R&D**: in 2025, it was the **company that registered the most new sector products in Brazil — 10 new registrations in a single year**. The product that best captures this approach:

Dulia | *Biological control of nematodes and soil diseases*
One of Gênica's leading technology cases: it already treats **2–3 million hectares in Brazil**, controlling nematodes and soil diseases, applied on seed or in-furrow. Suitable for TSI, it tolerates **up to 180 days on seed** and is compatible with chemicals. It is the **only product registered in Brazil with six microorganisms** (six bacteria produced separately), used for years by large clients.

Regionalization · from Brazil to all of LATAM

Built with a Latin American mindset, Gênica already replicates its model beyond Brazil. In **2022 it began operations in Paraguay** with its own subsidiary and today has **more than 5 registered bioinputs**; a strategic market given the weight of its agribusiness, the professionalization of its growers and its agronomic affinity with Brazil's Center-West, where **Dulia is gaining strong commercial traction**. In parallel, the company is advancing into **Central America** with field trials and commercial validations, **especially in Guatemala**. Its trajectory shows how technology born in the Brazilian Agtech ecosystem adapts and scales to other LATAM markets, consolidating the region as a global hub for innovation in sustainable agriculture and bioinputs.

Growth data

12x Revenue growth over the last 6 years	**10** New products registered in 2025 — sector record	**3 countries** Brazil and Paraguay; expansion into Central America	**R&D core** Own laboratory, strain bank and experimental fields

Why it matters. A mature LATAM bet on **biotechnology and regenerative agriculture**, reducing dependence on chemicals and proving that **the regenerative path can also be profitable**.

4. Method

• *Luiz Ojima Sakuda, Hyan Batista, Aurélio Martins Favarin, Federico Bert and Caterina Dalmasso*

4.1 Nature and Objective of the Study

Radar Agtech LAC is a structured mapping of startups with solutions applied to the agri-food sector in Latin America and the Caribbean. The study is descriptive and exploratory in nature: its purpose is to identify, organize, and analyze innovative companies operating across different production chains, technology domains, solution categories, and benefits associated with the sector.

The results presented in this report describe the database consolidated by the project. They should not be interpreted as an exhaustive statistical census of the regional ecosystem or as a probabilistic sample of all ag startups existing in the region.

4.2 Geographic and Thematic Scope

The reference territorial universe was Latin America and the Caribbean. The final database comprises 2,653 startups distributed across 23 countries, organized into five geographic and analytical segments: Southern Cone, Mexico, Andean Countries, Central America, and the Caribbean.

The 23 countries presented correspond to those in which startups meeting the inclusion criteria were identified by the closing date of the database used in this edition. Countries for which no startups meeting the inclusion criteria were validated were excluded from the quantitative analyses.The United States and Canada are not part of the mapping scope because they do not fall within the operational definition of Latin America and the Caribbean adopted in this study.

The thematic scope is not limited to food production. Solutions related to bioenergy, fibers, biomaterials, biodiversity, climate-related solutions, carbon management, traceability, logistics, financing, data, automation, connectivity, and other topics associated with agri-food value chains were considered.

4.3 Methodological Process

The methodological process was organized into five stages, summarized below. The complementary controls adopted throughout the process are documented in Annex I.

Figure 1. Summary of the methodological process of Radar Agtech LAC

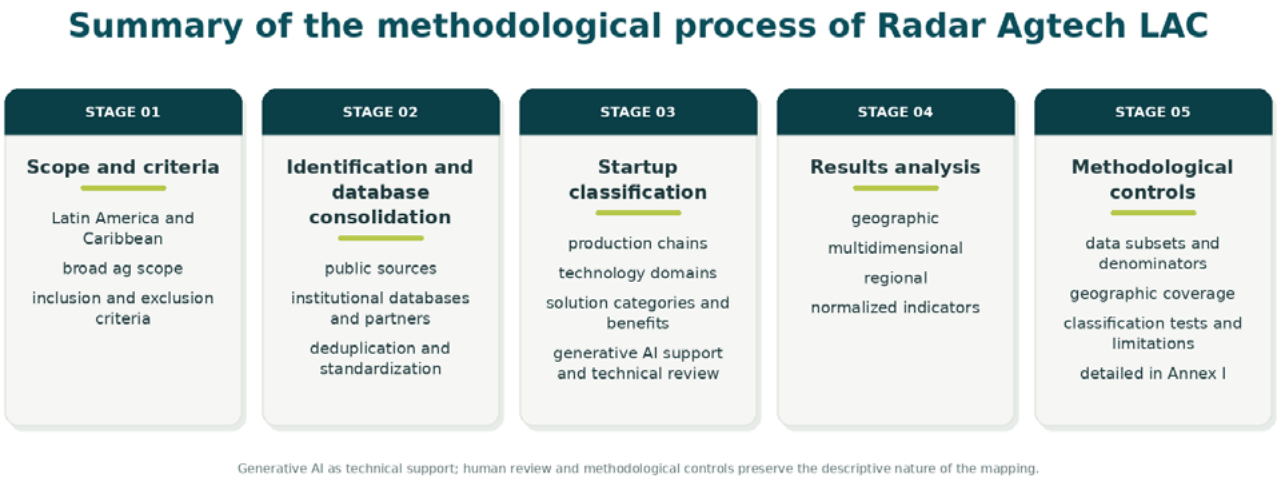


Figure 1 summarizes the methodological flow of the study. The process combined the definition of scope and criteria, identification and consolidation of records, classification across four analytical dimensions, generative AI support, technical review, descriptive analysis of the results, and documentation of methodological controls in Annex I.

Stage 1 - Scope and criteria. The study defined Latin America and the Caribbean as the reference territorial universe and adopted a broadened thematic scope for the ag sector, including solutions applied directly or indirectly to production chains, food production, energy, fibers, biomaterials, biodiversity, sustainability, climate, carbon, traceability, logistics, financing, data, automation, and connectivity. At this stage, the general inclusion and exclusion criteria, the unit of analysis, and the analytical dimensions used for classification were also defined.

Stage 2 - Identification and consolidation of the database. The startups were identified from public sources, institutional databases, partner information, and specialized directories. The process involved searching, screening, verification, deduplication, standardization, and consolidation of records. Records were included when they presented verifiable public evidence of activity - such as presence on an institutional website, startup directory, public profile, institutional news item, partner database, or another public source - and sufficient information to be assigned to at least one analytical dimension. Duplicate records, companies without a verifiable connection to the ag sector, organizations without sufficient evidence of activity, and cases without sufficient information for a consistent minimum classification were excluded. When necessary, records were complemented with information obtained from public sources, partner databases, institutional pages, specialized directories, and publicly available textual descriptions, with the aim of qualifying startup descriptions and supporting their classification within the study analytical dimensions.

Stage 3 - Classification. The startups were classified into four analytical dimensions: production chains, technology domains, solution categories, and associated benefits. Classification was carried out by the project with support from generative AI tools,

used for preliminary category assignment based on the public descriptions of the startups, the classification criteria, and previously validated examples. Classifications were reviewed during the database consolidation process, with special attention to ambiguous, incomplete, inconsistent cases or those with low adherence to the classification criteria. Complementary controls for assisted classification are presented in Annex I.

Stage 4 - Analysis. Geographic, multidimensional, and regional analyses were produced, as well as indicators normalized by population and GDP. As presented in the regional analysis, the consolidated database is concentrated in the Southern Cone, with a strong concentration in Brazil. This characteristic should be considered when interpreting aggregate results for the LAC region.

Stage 5 - Control and documentation. The inclusion and exclusion criteria, the data subsets used at different stages of the process, the interpretive considerations applicable to reading the results, and the controls related to the use of generative AI as support for classification were recorded.

4.4 Multi-category Classification Structure

The classification structure allows more than one category to be assigned to the same startup in each analytical dimension. A startup may, for example, be associated with more than one production chain, employ more than one technology, and generate different types of benefits simultaneously.

The four analytical dimensions were defined based on the convergence of different references and information needs. The process considered dimensions recurrent in the literature and in studies on innovation ecosystems; demands presented to IICA and to Radar Agtech Brasil and its co-organizers (Embrapa, SP Ventures, and Homo Ludens) for consolidated information on ag startups; and classification structures previously used in related initiatives, including Radar Agtech Brasil and the Agtech Americas platform, organized by IICA, assessed for their effectiveness in previous applications.

The Agtech Americas platform uses dimensions such as sector, subsector, technologies, and benefits/impacts. On the public platform, the dimension related to expected outcomes appears as “benefits/impacts” or as “objectives”, depending on the display context. These dimensions were considered as one of the references for Radar Agtech LAC, although the correspondence between the structures is partial. In Radar Agtech LAC, sector and subsector relate to production chains and solution categories; technologies relate to technology domains; and benefits/impacts relate to associated benefits.

The solution categories correspond to the 33 categories adopted in Radar Agtech Brasil 2025, with the addition of the Robotics category, introduced in this edition of Radar Agtech LAC to account for emerging solutions identified in the regional ecosystem. The definition of the dimensions was refined through rounds of pre-classification and testing with startups selected from random samples and from exemplary cases with greater visibility in the regional ecosystem, analyzed by the Radar Agtech LAC team. This process made it possible to adjust the structure to combine analytical comparability, adherence to sector vocabulary, and the ability to represent the diversity of mapped solutions.

For this reason, the percentages presented in the report should not be added together as if they represented parts of a total of 100%. When the denominator is the total database or a regional segment, the percentage indicates the proportion of startups associated with a given category. When the denominator is the total number of assignments in a dimension, the percentage indicates that category share in the set of classifications performed, and not the proportion of startups.

Table 1. Correspondence between the analytical dimensions of Radar Agtech LAC, Radar Agtech Brasil, and the AgTech Americas platform

Radar Agtech LAC	Classification options	Radar Agtech Brasil	AgTech Americas
Production chains	13 categories	Production chains in the survey	Sector / Subsector
Technology domains	5 domains	No directly equivalent dimension	Technologies
Solution categories	34 categories	Solution categories	Sector / Subsector, with partial correspondence
Associated benefits	8 benefits	SDGs in the survey, with partial correspondence	Benefits/impacts or objectives

The correspondence is indicative. The classification structures are not directly equivalent because they were built for different purposes. The Radar Agtech LAC structure presents greater granularity in solution categories and explicitly defines associated benefits as a stand-alone analytical dimension.

4.5 Analytical Dimensions and Categories

This section presents the analytical dimensions and categories used in Radar Agtech LAC, organized into four dimensions: production chains, technology domains, solution categories, and associated benefits. The following tables present the categories and descriptions used as references for classifying the mapped startups.

Production Chains

Table 2 presents the production chains considered in the classification of startups, covering agricultural, livestock, forestry, and aquaculture activities, as well as cross-cutting solutions for the ag sector.

Table 2. Production chains used in the Radar Agtech LAC classification

Production chain	Description and typical examples
Agricultural crops	Production of short- and long-cycle crops intended for food, fibers, energy, or industrial raw materials. Examples: soybeans, corn, rice, wheat, sugarcane, coffee, cocoa, cotton.

Production chain	Description and typical examples
Horticulture and fruit growing	Intensive cultivation of vegetables, fruits, and plants in open fields or protected environments. Examples: lettuce, tomato, grapes, mango, orange.
Floriculture	Production of flowers and ornamental plants in open fields or protected environments.
Seed and seedling production	Multiplication, certification, and commercialization of plant material for agricultural, forestry, or fruit-growing plantations.
Dairy farming	Rearing and production of milk and dairy products.
Beef cattle farming	Rearing, growing, fattening, and production of cattle for meat and by-products. Examples: feedlots and extensive grazing.
Poultry farming	Intensive poultry rearing for meat or egg production. Examples: broiler chickens, laying hens, integrated agroindustrial chains.
Swine farming	Intensive production of pigs for meat and by-products.
Sheep and goat farming	Rearing of sheep and goats for meat, milk, wool, or leather.
Beekeeping and sericulture	Rearing of bees and silkworms to obtain food products and natural fibers.
Forestry	Production, management, and sustainable use of forest resources, including timber, pulp, and non-timber products.
Fishing and aquaculture	Capture of fish and seafood in natural environments and controlled cultivation of aquatic organisms. Examples: artisanal and industrial fishing, tilapia farming, shrimp farming.
Multiple chains	Activities, technologies, or solutions that simultaneously impact more than three specific ag production chains. Examples: digital platforms, rural fintechs, multipurpose bioinputs, logistics, and traceability.

Each startup can be classified into one or more chains. Percentages indicate the proportion of startups in the database, or in the regional segment, to which the category was assigned.

Technology Domains

Table 3 describes the technology domains used to identify the predominant or complementary technological basis of the mapped solutions.

Table 3. Technology domains used in the Radar Agtech LAC classification

Technology domain	Description
Digital	Information, communication, and computational intelligence technologies, including ICT, remote sensing, software, AI, big data, blockchain, predictive analytics, and computer vision, applied to digitalization, integration, and decision-making in the ag sector.

Technology domain	Description
Mechatronic	Integrates mechanics, electronics, robotics, sensors, and automation to improve precision, efficiency, and autonomy in agricultural and industrial operations.
Biological	Based on knowledge and management of natural biological processes - ecology, microbiology, and plant and animal physiology, soil-plant-microorganism interactions - without direct modification of genetic material. Includes bioinputs, biological control, and regenerative soil management.
Physicochemical	Nanotechnology, green chemistry, new materials, synthesis processes, and compound sciences applied to inputs, packaging, and quality control.
Biotechnology	Technologies that intervene in, modify, or redesign biological systems through genomics, gene editing, synthetic biology, metabolic engineering, and cellular or microbial culture platforms. Includes advanced genetic improvement, precision fermentation, and alternative proteins.

Each startup can be classified into one or more technology domains.

Solution Categories

Table 4 details the solution categories, organized according to their predominant position before, on, or Post-Farm.

Table 4. Solution categories used in the Radar Agtech LAC classification

Solution category	Description
Pre-Farm	
Laboratory analysis, trials, and simulations	Services and platforms for analyzing soil, plant tissue, water, and inputs; field trials and agronomic simulations.
Credit, insurance, carbon credits, and financial management	Rural credit instruments, barter, agricultural insurance, carbon credits, tokenization, and fiduciary analysis.
Fertilizers, inoculants, and plant nutrition	Development and commercialization of fertilizers, microbial inoculants, and plant nutrition solutions.
Genomics and animal reproduction	Solutions for genetic improvement, assisted reproduction, and genomic diagnostics for animal species.
Agricultural input marketplace	Digital platforms for buying and selling inputs for agricultural and livestock production.

Solution category	Description
Animal nutrition and health	Diets, supplements, vaccines, veterinary diagnostics, and animal welfare solutions.
Seeds, seedlings, and plant genomics	Development, certification, and commercialization of seeds and seedlings; plant genomics and breeding.
On-Farm	
Beekeeping and pollination	Technologies and platforms for hive management, honey production, and agricultural pollination management.
Technical assistance, communication, education, and networks	Education, training, digital technical assistance, content communication, and communities for the sector.
Connectivity and telecommunications	Solutions for internet access, communication, and network infrastructure in rural areas.
Pest, weed, and disease control	Technologies and platforms for integrated pest, disease, and weed management, including biological control.
Drones, machinery, and equipment	Autonomous or manned equipment for application, harvesting, monitoring, and field operations.
Sharing economy	Platforms for sharing machinery, services, and resources among rural producers.
Agricultural waste management	Solutions for the treatment, reuse, and valorization of agricultural and livestock production waste.
Internet of Things for agriculture	Connected sensors and data networks for monitoring soil, climate, irrigation, and other production parameters.
Meteorology, irrigation, and water management	Weather forecasting systems, irrigation management, and water-use management.
Data platforms and systems integration	Solutions for integration, interoperability, and management of agricultural and livestock data platforms.
Robotics	Autonomous or semi-autonomous robotic systems applied to agricultural operations such as harvesting, planting, and monitoring. Category introduced in this edition of Radar Agtech LAC.
Farm/business management system	Operational, administrative, and accounting management software for rural properties and agribusiness companies.

Solution category	Description
Remote sensing, diagnostics, and image-based monitoring	Solutions based on satellite imagery, aerial photogrammetry, and computer vision for crop diagnosis and monitoring.
Telemetry and automation	Telemetry, remote control, and process automation systems in agricultural and livestock facilities.
Post-Farm	
Urban agriculture and new forms of cultivation	Vertical farms, plant factories, urban hydroponics, and food production in non-traditional environments.
Innovative foods and new food trends	Alternative proteins, functional foods, fermented foods, innovative ingredients, and new food categories.
Storage, infrastructure, and logistics	Solutions for storage, refrigeration, transportation, and handling of agricultural and livestock production.
Biodiversity and sustainability	Platforms and solutions for biodiversity conservation, regenerative practices, and environmental impact management.
Bioenergy and renewable energy	Energy production from biomass and integration of renewable sources into ag value chains.
Cloud kitchens and dark kitchens	Operation of kitchens without in-person service, focused on meal production and delivery.
Food industry and processing 4.0	Automation, quality control, and digitalization for the food processing industry.
Markets and commercialization platforms	Digital platforms for purchasing, selling, and distributing agricultural and food products.
Online restaurants and meal kits	Online ordering platforms, meal delivery, and ingredient kits for home preparation.
Food safety and traceability	Origin tracking, certification, chain-of-custody management, and food safety assurance.
Online supermarkets	Digital retail platforms for selling food and consumer products.
Autonomous store and food service management system	Automation and autonomous management for retail establishments and food service operations.
Packaging, environmental, and recycling systems	Sustainable packaging, packaging waste management, and recycling in the ag chain.

The before, on, and after the farm structure organizes categories by stage in the production chain. Each startup can be classified into one or more categories.

Associated Benefits

Table 5 presents the benefits associated with the mapped solutions, used to identify the types of results, gains, or impacts related to the startups.

Table 5. Associated benefits used in the Radar Agtech LAC classification

Benefit	Description
Increase production and improve operational efficiency	Process optimization, efficient use of inputs, and improvement of product quality. Oriented toward increasing yield, reducing losses, and incorporating precision and automation.
Strengthen market access, marketing, and sales	Market insertion and diversification through commercial strategies, differentiation, traceability, and competitive positioning.
Improve profitability, financial stability, and access to financing	Increased returns, reduced financial risks, and access to financing instruments and rural credit.
Strengthen environmental sustainability and climate resilience	Reduction of environmental impacts, regeneration of resources, and adaptation to climate variability.
Improve the quality, safety, and integrity of agri-food products	Certification, traceability, quality standards, and systematic control throughout production chains.
Promote inclusion and access to knowledge	Training, access to technology, and reduction of socioeconomic and digital gaps for producers and rural communities.
Optimize governance, coordination, and transparency	Institutional articulation and coordination among ecosystem actors through common standards, interoperability, and cooperation.
Improve working conditions and occupational safety, and reduce labor risks	Technologies and practices that reduce physical, chemical, biological, and ergonomic risks in agricultural and livestock work environments.

Each startup can be associated with one or more benefits.

4.6 Interpreting Percentages and Denominators

The report uses percentages calculated over different denominators. Correct interpretation depends on the type of table, figure, or analytical passage. Table 6 summarizes the types of percentages used in the report, specifying the denominator and the appropriate interpretation in each case.

Table 6. Types of percentages and denominators used in the report

Type of percentage	Denominator	Use in the report	Interpretation
Percentage of the total database	2,653 startups	Distribution by country, regional segment, and overall presence of categories	Indicates the proportion of the final database associated with a given country, regional segment, chain, domain, category, or benefit.
Internal percentage of the regional segment	Total startups in the regional segment	Comparisons within the Southern Cone, Mexico, Andean Countries, Central America, and the Caribbean	Indicates the relative presence of categories within each regional segment.
Percentage of the total assignments in a dimension	Total classifications performed in that dimension	Complementary tables on the internal composition of classifications	Indicates a category share in the set of assignments in a dimension, and not the proportion of startups.

In the main results tables and figures, the captions indicate whether the percentage presented corresponds to "% of startups in the database", "% of startups in the regional segment", or "% of total assignments". This distinction is necessary because the categories are not mutually exclusive.

In country-level visualizations, when the "Top 15" subset is used, the criterion corresponds to the 15 countries with the highest absolute number of startups mapped in the final database. The remaining countries are presented in aggregate form or addressed in the annexes, when information is available.

4.7 Normalized Indicators

In addition to absolute frequencies and internal percentages, indicators normalized by population and current GDP were calculated for selected countries and regional segments. These indicators have a complementary function: they help observe the relative intensity of the mapped database in relation to demographic and economic scale.

The indicators were calculated from World Bank secondary data (World Development Indicators), using total population and current GDP in United States dollars for the reference year available and indicated in the corresponding tables. The formulas applied were:

Startups per 1 million inhabitants = number of startups / population x 1,000,000

Startups per US$ 1 billion of GDP = number of startups / current GDP in dollars x 1,000,000,000

These indicators do not, in isolation, measure ecosystem maturity, quality, impact, or technological sophistication. Countries with smaller populations or GDP may present high densities even with few absolute cases. Therefore, normalized indicators should be interpreted

together with absolute volume, regional composition, database coverage, and the quality of available information.

4.8 Limitations

The study has limitations typical of exploratory mapping. The database is not probabilistic; there is regional concentration in the Southern Cone and in Brazil; some segments have a small number of startups; and classification with multiple categories requires attention to the denominator used in each analysis. Regional concentration should also be considered when reading the aggregate results: Brazil accounts for approximately 78.2% of the final database, which strongly influences the patterns observed for the LAC region.

Segments with a smaller number of records, especially the Caribbean, with 8 startups, and Central America, with 27 startups, should be interpreted with caution. In these cases, small absolute variations can produce large percentage variations.

The analyses are descriptive. No formal statistical tests of differences between regional segments, causal models, or predictive estimates were conducted. Expressions such as concentration, predominance, and relative intensity describe the mapped database - and not properties of national or regional ecosystems.

4.9 Methodological comparability between the Radar Agtech LAC and the Radar Agtech Brasil

The comparison between the categories of the Radar Agtech Latin America and the Caribbean (Radar Agtech LAC) and the categories historically presented in the Radar Agtech Brasil requires methodological caution. Although the Radar Agtech LAC was developed based on the experience accumulated by the Radar Agtech Brasil, it does not constitute a direct geographic expansion of the Brazilian base or a chronological continuity of the national series. It is a new transnational methodological design, structured to produce a comparable regional base in a context marked by different levels of ecosystem maturity, unequal availability of public information, institutional diversity, and productive heterogeneity between countries.

This difference in design appears, above all, in the classification structure adopted. The Radar Agtech LAC uses a multi-dimensional, multilabel matrix, organized into four analytical dimensions — production chains, technological domains, solution categories, and benefits. This option allows us to better represent the transversal nature of agribusiness startups, which often operate in more than one production chain, mobilize different technological bases, and generate multiple benefits simultaneously. At the same time, this structure alters the direct comparability with the classifications historically used in the Radar Agtech Brasil, especially when observing relative frequencies by segment or category.

The differences observed in the Post-Farm segment, particularly in the category Innovative foods and new food trends, should be interpreted in the light of this methodological change and the conditions of informational coverage of the regional base. The lower proportional participation of this category in the Radar Agtech LAC does not, in itself, constitute evidence of the structural decline of these solutions in the Latin American and Caribbean ecosystem. It reflects the combination of a sectoral delineation criterion focused on demon-

strable connections to the agri-food sector, the need for taxonomic harmonization across countries, and the uneven availability of public evidence regarding startups outside Brazil. In ecosystems with a lower density of institutional databases, public records, and specialized information sources, there is a greater risk of underrepresenting companies whose connection to agriculture is not clearly documented.

Therefore, the percentages presented in the Radar Agtech LAC should be interpreted as the distribution of classifications observed within the mapped regional database, rather than as a census-based estimate of the Latin American and Caribbean universe or as a direct continuation of the percentages reported in the Radar Agtech Brasil. Comparison with the Brazilian series is relevant as a historical and methodological reference; however, it does not allow for the direct inference of temporal changes between the two studies.

In the case of the Post-Farm categories, this caution is particularly important, since some solutions associated with innovative foods, new consumption models, food retail, and food processing may exhibit different levels of publicly available evidence and varying degrees of explicit connection to agricultural value chains, stakeholders, challenges, or opportunities in each country.

5. Multidimensional analysis of startups

• *Luiz Ojima Sakuda, Aurélio Martins Favarin, Aurelio Vinícius Borsato, Alice Alcântara, Caterina Dalmasso, Hyan Batista and Shalon Silva de Souza Figueiredo*

The multidimensional analysis of startups in Radar Agtech LAC provides a comprehensive view of the ecosystem from four complementary dimensions: **production chains**, **technological domains**, **solution categories** and **benefits**. This reading helps to identify not only where startups are located, but also in which chains they operate, which technological bases they mobilize, at what stage of the agri-food value chain they concentrate their solutions, and what types of results or impacts they intend to generate.

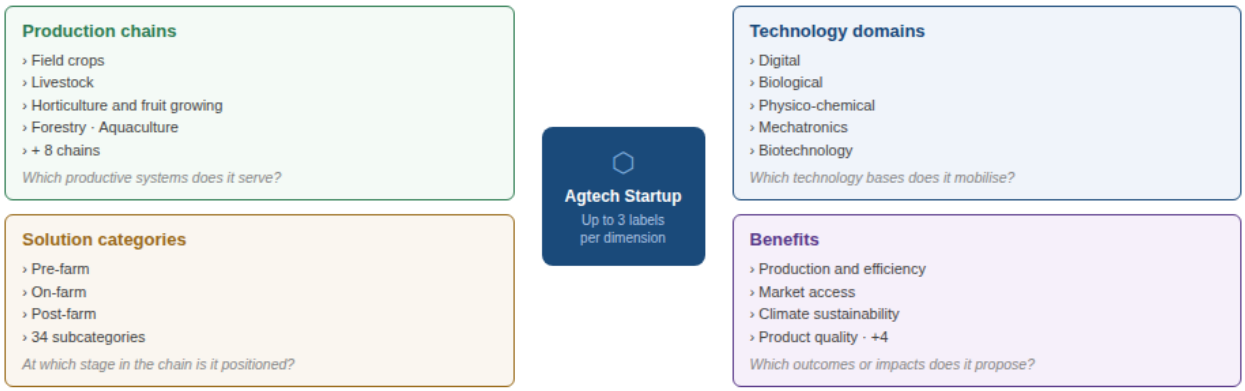
Figure 5.1 summarizes the analytical framework used to characterize startups in four complementary dimensions. The reading should consider that the categories are not exclusive and that the same startup can be associated with more than one option in each dimension.

FIGURE 5.1

Multidimensional and multi-label taxonomic structure of Radar Agtech LAC

The four analytical dimensions applied to the mapping of 2,653 startups across 23 countries

The analysis of 2,653 startups is organised across four complementary dimensions: production chains, technology bases, positioning in the agro-industrial chain, and generated benefits. The classification is **multi-label**: each startup may receive up to three labels per dimension. *Methodological note: the percentages shown in subsequent figures indicate label penetration rates over the total base and should not be summed, as they do not form mutually exclusive partitions.*



Source: Radar Agtech LAC 2026 — Embrapa, Homo Ludens, SP Ventures and IICA.

In general, the data point to an ecosystem strongly concentrated in the **Southern Cone**, especially due to Brazil's weight in the base, but with different regional profiles. In thematic terms, solutions associated with **agricultural crops**, **digital technologies**, **On-Farm operations,** and **gains in production and operational efficiency** predominate. At the same time, the presence of biological, physicochemical, mechatronic domains, and categories linked to sustainability, markets, traceability, and financing indicates that the ecosystem is not restricted to digitalization, but combines different technological trajectories and value-generating models.

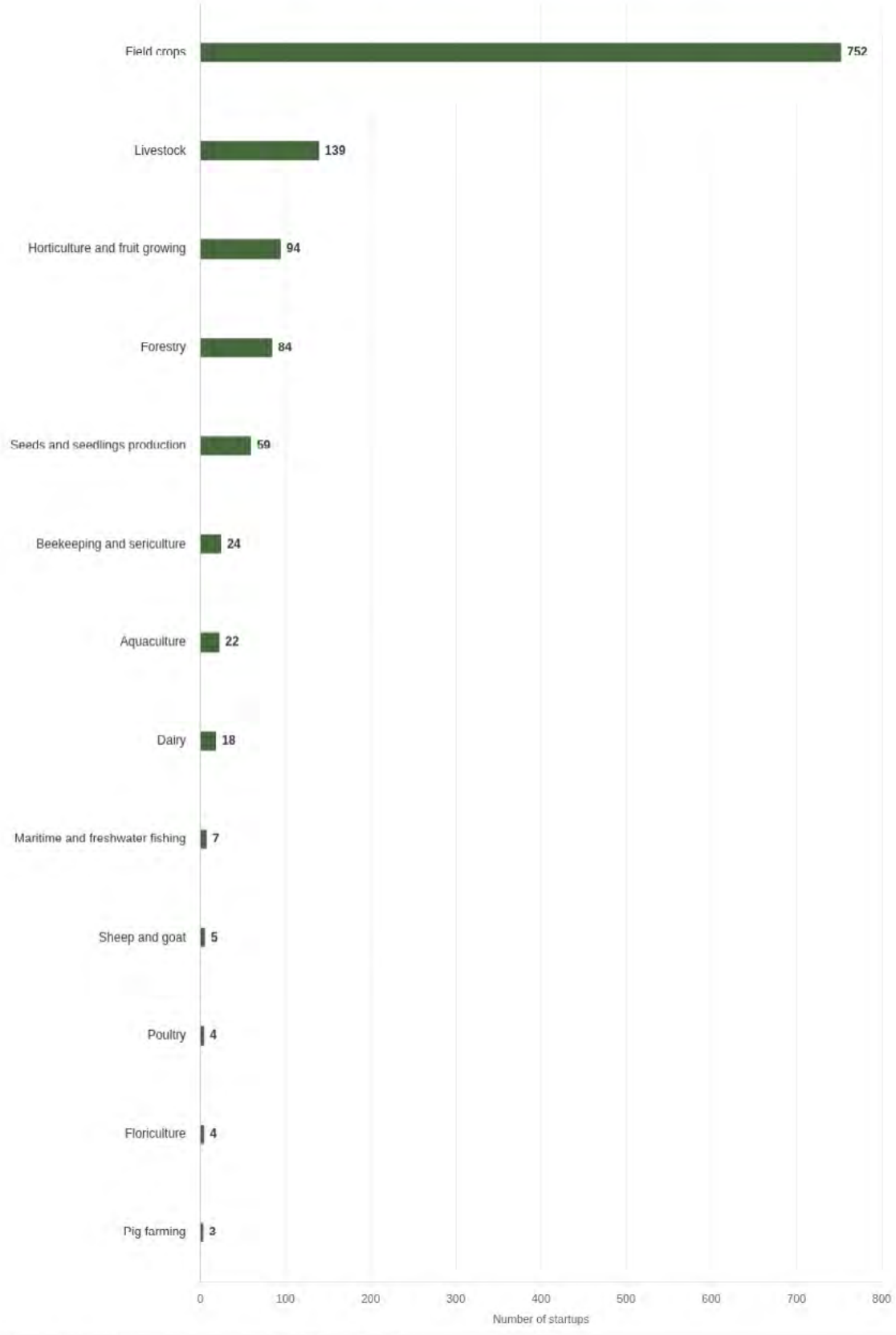
5.1 Production chains

Figure 5.2 shows the frequency of the production chains in the mapped database. The Figure should be read as the presence of categories assigned to startups, and not as an exclusive distribution between chains.

FIGURE 5.2

Production chains — frequency in the mapped base

Number of startups associated with each chain · N = 2,653 · all 13 chains



Source: Radar Agtech LAC 2026 — Embrapa, Homo Ludens, SP Ventures and IICA.

In the production chains, considering the **total base of 2,653 startups as the denominator**, the most frequent chain is **agricultural crops**, with **752 occurrences**, equivalent to **28.3% of the total base**. Next come **livestock**, with **139 occurrences**, or **5.2% of the total base**; **horticulture and fruit growing**, with **94 occurrences**, or **3.5% of the total base**; **forestry**, with **84 occurrences**, or **3.2% of the total base**; and **production of seeds and seedlings**, with **59 occurrences**, or **2.2% of the total base**. These five chains concentrate the highest frequencies of the classification, indicating a predominance of solutions related to plant production, agricultural production systems and agricultural activities with greater economic and technological scope.

In this report, production chains refer to the agricultural production systems, value chains, and agribusiness activities to which an Agtech's solution, product, service, platform, process, or business model is related.

The other chains appear with less relative frequency in the total base: **beekeeping and sericulture**, with **24 occurrences**, or **0.9% of the total base**; **fishing and aquaculture**, with **22 occurrences**, or **0.8% of the total base**; **milk**, with **18 occurrences**, or **0.7% of the total base**; **sea and inland fishing**, with **7 occurrences**, or **0.3% of the total base**; **sheep-goats**, with **5 occurrences**, or **0.2% of the total base**; **poultry** farming, with **4 occurrences**, or **0.2% of the total base**; **floriculture**, with **4 occurrences**, or **0.2% of the total base**; and **swinw farming**, with **3 occurrences**, or **0.1% of the total base**. These numbers suggest that there is room for further future deepening in specific chains, especially when considering the productive and territorial characteristics of each subregion.

In the analysis by subregion, the denominator becomes the total number of startups in each subregion. In **agricultural crops**, the Southern Cone has **666 occurrences**, equivalent to **27.7% of the startups in the Southern Cone (n = 2,404)**. Central America registers **21 occurrences**, equivalent to **77,8% of Central American startups (n = 27)**. The Andean Countries add up **to 39 occurrences**, equivalent to **36.8% of the startups in the subregion (n = 106)**. Mexico registers **25 occurrences**, equivalent to **23.1% of Mexican startups (n = 108)**. The Caribbean has **1 occurrence**, equivalent to **12,5% of Caribbean startups (n = 8)**.

Livestock is also concentrated in absolute terms in the Southern Cone, with **127 occurrences**, equivalent to **5.3% of startups in the subregion (n = 2,404)**. In the Andean Countries, there are **8 occurrences**, or **7.5% of the startups in the subregion (n = 106)**; in Central America, **3 occurrences**, or **11,1% of the startups in the subregion (n = 27)**; in Mexico, **1 occurrence**, or **0.9% of the Mexican startups (n = 108)**; and in the Caribbean there is no occurrence in this chain in the analyzed database, or 0,0%. In **horticulture and fruit growing**, the Caribbean has **3 occurrences**, equivalent to **37,5% of the startups in the subregion (n = 8)**, while the Andean Countries register **15 occurrences**, or **14.2% (n = 106)**, Mexico **12 occurrences**, or **11.1% (n = 108)**, **Central America 6 occurrences**, or **22,2% (n = 27)**, and the Southern Cone **58 occurrences**, or **2.4% (n = 2,404)**.

This distribution shows that reading only by absolute frequency tends to reinforce the weight of the Southern Cone, while proportional reading shows important relative specializations in smaller subregions. Central America, for example, has a low absolute share in the total base, but has a strong relative concentration in agricultural crops. The Caribbean, although it has only eight startups at the base, has a high proportional weight in horticulture and fruit growing. The Andean Countries combine a relevant presence in agricultural crops,

horticulture and fruit growing, livestock and aquaculture, which suggests greater relative diversity within a smaller regional base.

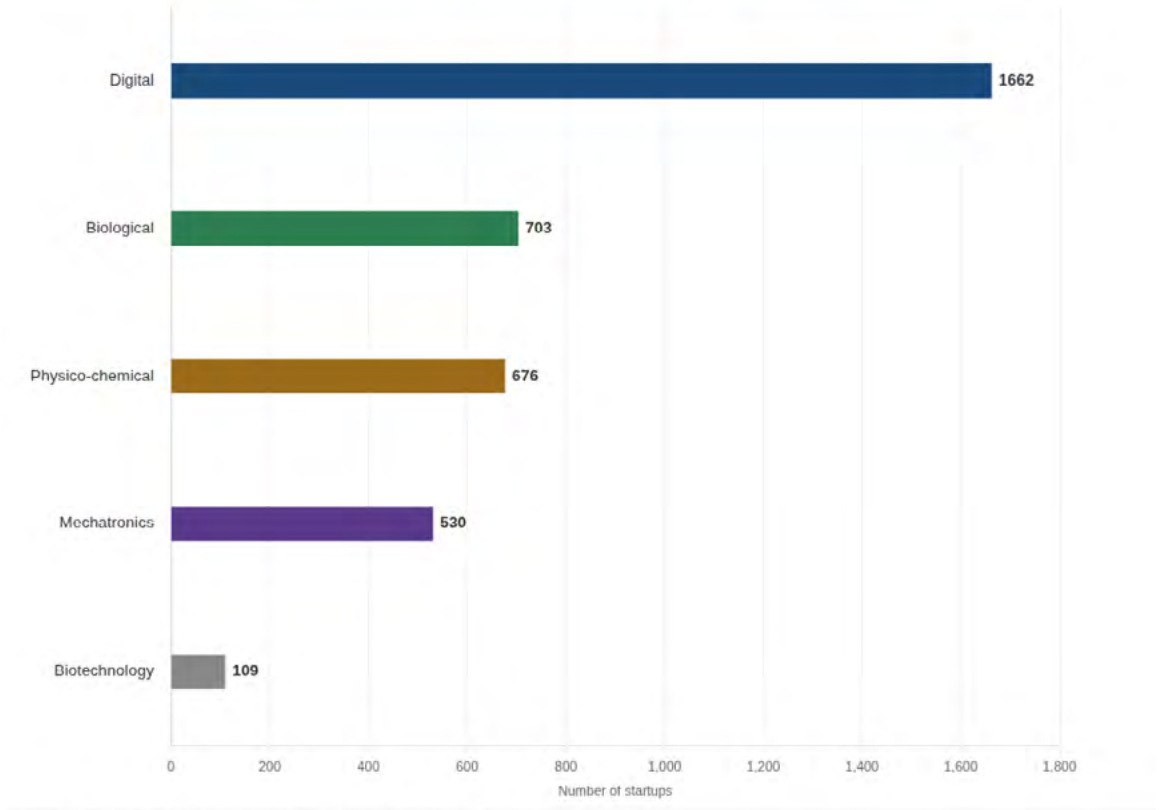
Approximately **1,494 of the 2,653 mapped startups**, representing **56.3% of the database**, operate across multiple production chains. Therefore, the overlaps indicate **multiple associations rather than mutually exclusive categories**.

5.2 Technological domains

Figure 5.3 shows the distribution of startups according to the identified technological domains. As the classification admits multiple domains per startup, the values indicate the occurrence of technological association in the base.

FIGURE 5.3
Technology domains — frequency in the mapped base
Number of startups by predominant or complementary technology domain - N = 2,653

The digital domain is present in 1,662 startups (62.6%). Biological (703; 26.5%) and physico-chemical (676; 25.5%) show similar penetration, followed by mechatronics (530; 20.0%) and biotechnology (109; 4.1%). Methodological note: values indicate the number of startups mobilising each technology base — they should not be summed.



Source: Radar Agtech LAC 2026 — Embrapa, Homo Ludens, SP Ventures and IICA.

In the technological domains, considering the **total base of 2,653 startups** as the denominator, the **digital domain** is the most frequent, with **1,662 occurrences**, equivalent to **62.6% of the total base**. This result confirms the centrality of solutions based on data, software, platforms, connectivity, sensing, analytical intelligence and digital technologies applied to agribusiness.

In this report, technological domains refer to the predominant or complementary technological base mobilized by the Agtech's management solution, product, service, platform, process, or business model.

The second most frequent domain is biological, with **703 occurrences**, equivalent to **26.5% of the total base**. Next comes the **physicochemical domain**, with **676 occurrences**, or **25.5% of the total base**; the **mechatronic domain**, with **530 occurrences**, or **20.0% of the total base**; and **biotechnology**, with **109 occurrences**, or **4.1% of the total base**. These data indicate that, although digital is dominant, there is a significant presence of solutions based on inputs, bioinputs, materials, equipment, automation, machinery, and science-based technologies.

In the regional analysis, the digital domain appears in all subregions. In the Southern Cone, there are **1,499 occurrences**, equivalent to **62.4% of the startups in the Southern Cone (n = 2,404)**. In Central America, there are **24 occurrences**, equivalent to **88,9% of the startups in the subregion (n = 27)**. In the Andean Countries, there are **78 occurrences**, equivalent to **73.6% of the startups in the subregion (n = 106)**. In Mexico, there are **58 occurrences**, equivalent to **53.7% of Mexican startups (n = 108)**. In the Caribbean, there are **3 occurrences**, equivalent to **37,5% of Caribbean startups (n = 8)**.

Mexico stands out for the relative presence of the **biological domain**, with **45 occurrences**, equivalent to **41.7% of Mexican startups (n = 108)**. This percentage is higher than that observed in the Southern Cone, where the biological domain totals **652 occurrences**, equivalent to **27.1% of the startups in the subregion (n = 2,404)**, and also higher than that of the Andean Countries, with **4 occurrences**, or **3.8% (n = 106)**, of Central America, with **1 occurrence**, or **3.7% (n = 27)**, and the Caribbean, with **1 occurrence**, or **12,5% (n = 8)**.

The **physicochemical domain** has a relevant weight in the Southern Cone, with **665 occurrences**, equivalent to **27.7% of the startups in the subregion (n = 2,404)**. In the other subregions, its participation is lower: Mexico, with **5 occurrences**, or **4.6% (n = 108)**; Andean countries, with **3 occurrences**, or **2.8% (n = 106)**; Central America, with **2 occurrences**, or **7,4% (n = 27)**; and the Caribbean, with **1 occurrence**, or **12,5% (n = 8)**. The **mechatronics** domain also has a relevant presence: **482 occurrences** in the Southern Cone, equivalent to **20.0% of the startups in the subregion**; **18 occurrences** in the Andean Countries, or **17.0%**; **15 occurrences** in Mexico, or **13.9%**; **13 occurrences** in Central America, or **48,1%**; and **2 occurrences** in the Caribbean, or **25,0%**.

A joint reading of the technological domains suggests that digitalization is transversal to the LAC ecosystem, but does not exhaust its technological dynamics. The Southern Cone has greater absolute and relative diversity between digital, physicochemical, biological and mechatronic. Mexico combines digitalization and a strong relative presence of the biological domain. Central America and the Andean Countries have a digital predominance, with a relevant presence of mechatronics. The Caribbean, while still based on a small sample, should be interpreted with caution, but it shows a combination of digital, mechatronic, biological and physicochemical.

5.3 Categories of solutions

In the classification by macrosegments, considering the **total base of 2,653 startups** as the denominator, solutions **On-Farm** are the most frequent, with**1,789 occurrences**, equivalent to **67.4% of the total base**. This is followed by **Post-Farm solutions**, with **649 occurrences**, or **24.5% of the total base**, and **Pre-Farm solutions**, with **628 occurrences**, or **23.7% of the total base**. As the classification is multilabel, these percentages indicate the proportion of occur-

rences associated with each macro-segment in relation to the total number of startups in the base, and not an exclusive division of the base into three parts.

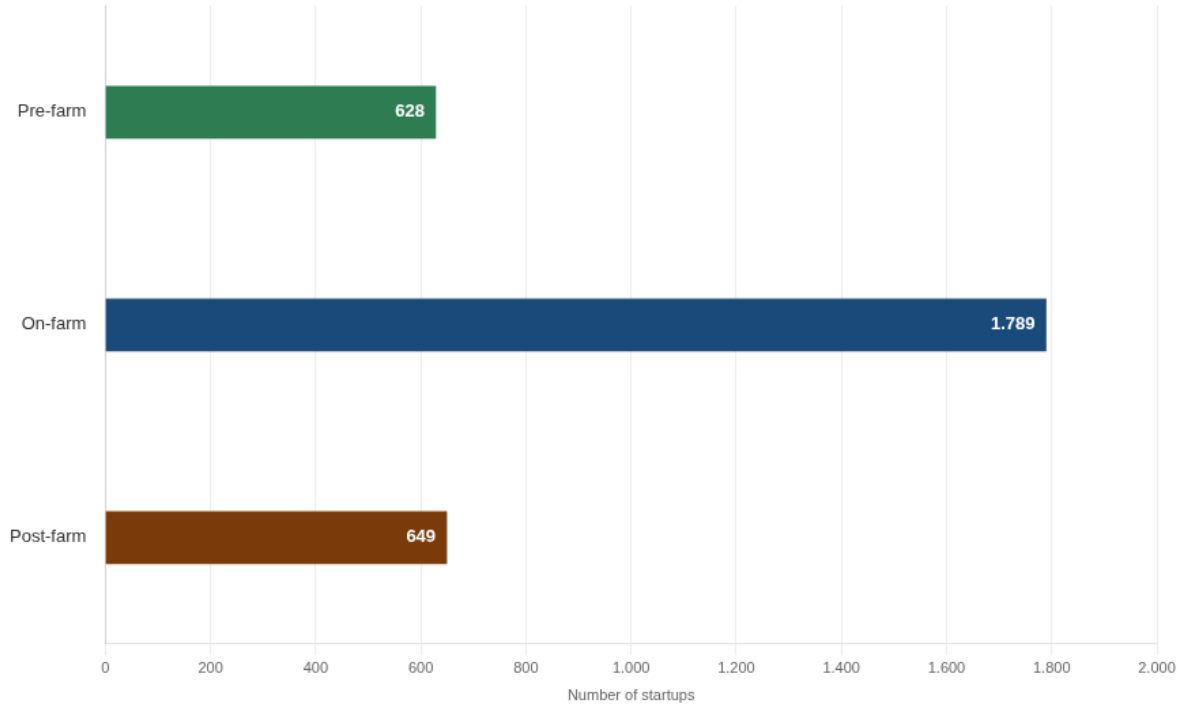
Figure 5.4 shows the positioning of the solutions in the Agro chain, grouping the categories into pre, on and post farm. This reading provides an aggregated view before drilling down into the specific categories.

FIGURE 5.4

Positioning of solutions along the agro-industrial chain

Number of startups by macro-segment · N = 2,653

Solutions **on-farm** total 1,789 startups (67.4%); **post-farm**, 649 (24.5%); and **pre-farm**, 628 (23.7%). Figures 5.4a, 5.4b and 5.4c detail the categories within each macro-segment.
Methodological note: macro-segments are not mutually exclusive — startups with integrated solutions may be classified in more than one. Values should not be summed.



Source: Radar Agtech LAC 2026 — Embrapa, Homo Ludens, SP Ventures and IICA.

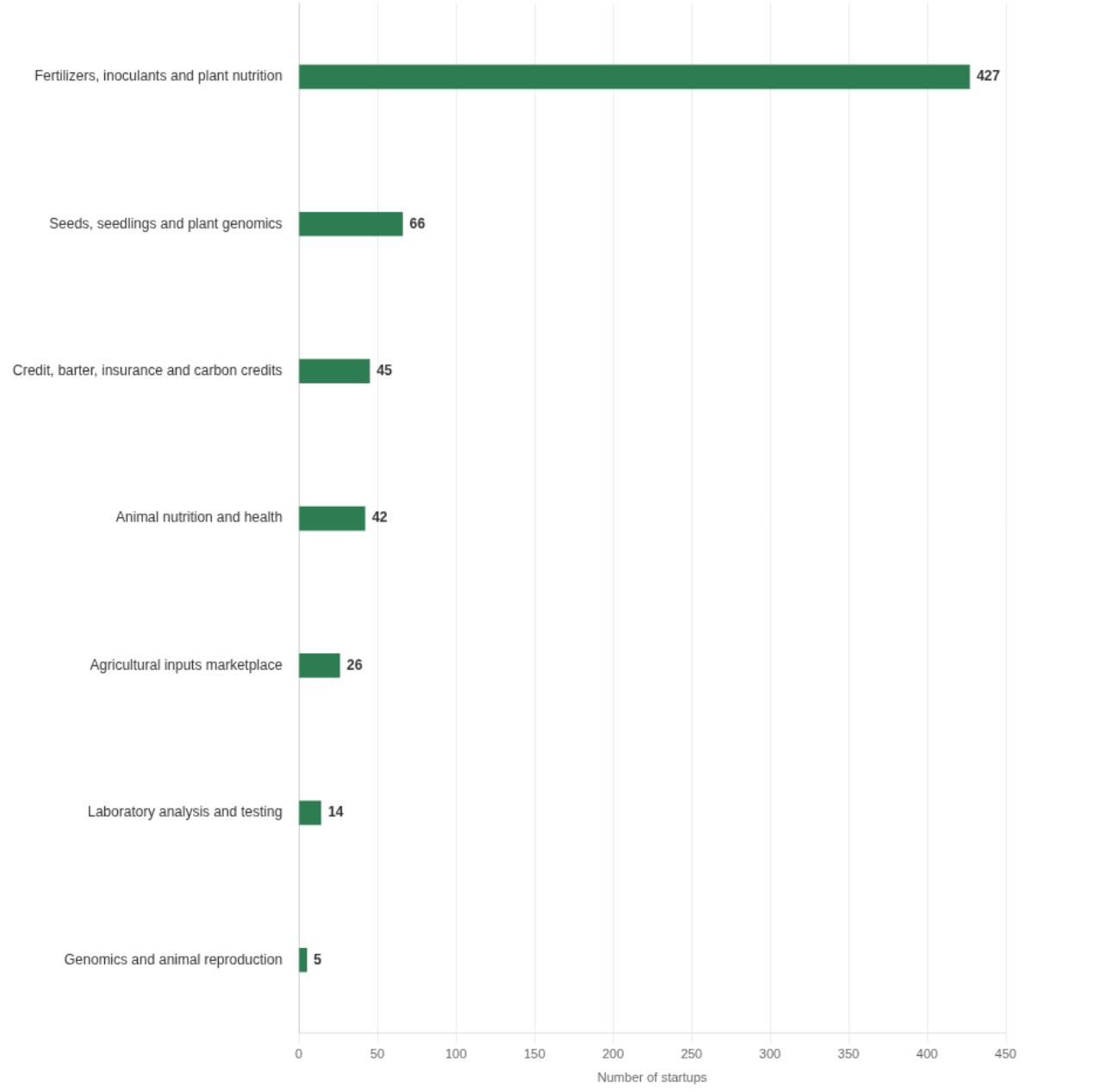
Solution categories are those that classify the solution, product, service, platform, process or business model presented by the Agtech, according to its position and function in the stages pre, on and post farm.

Figure 5.4A details the categories of solutions classified as Pre-Farm. The values indicate the frequency of startups associated with each category of this macrosegment.

FIGURE 5.4A

Pre-Farm Categories — frequency in the mapped base

Number of startups by category within the pre-farm segment · N = 2,653



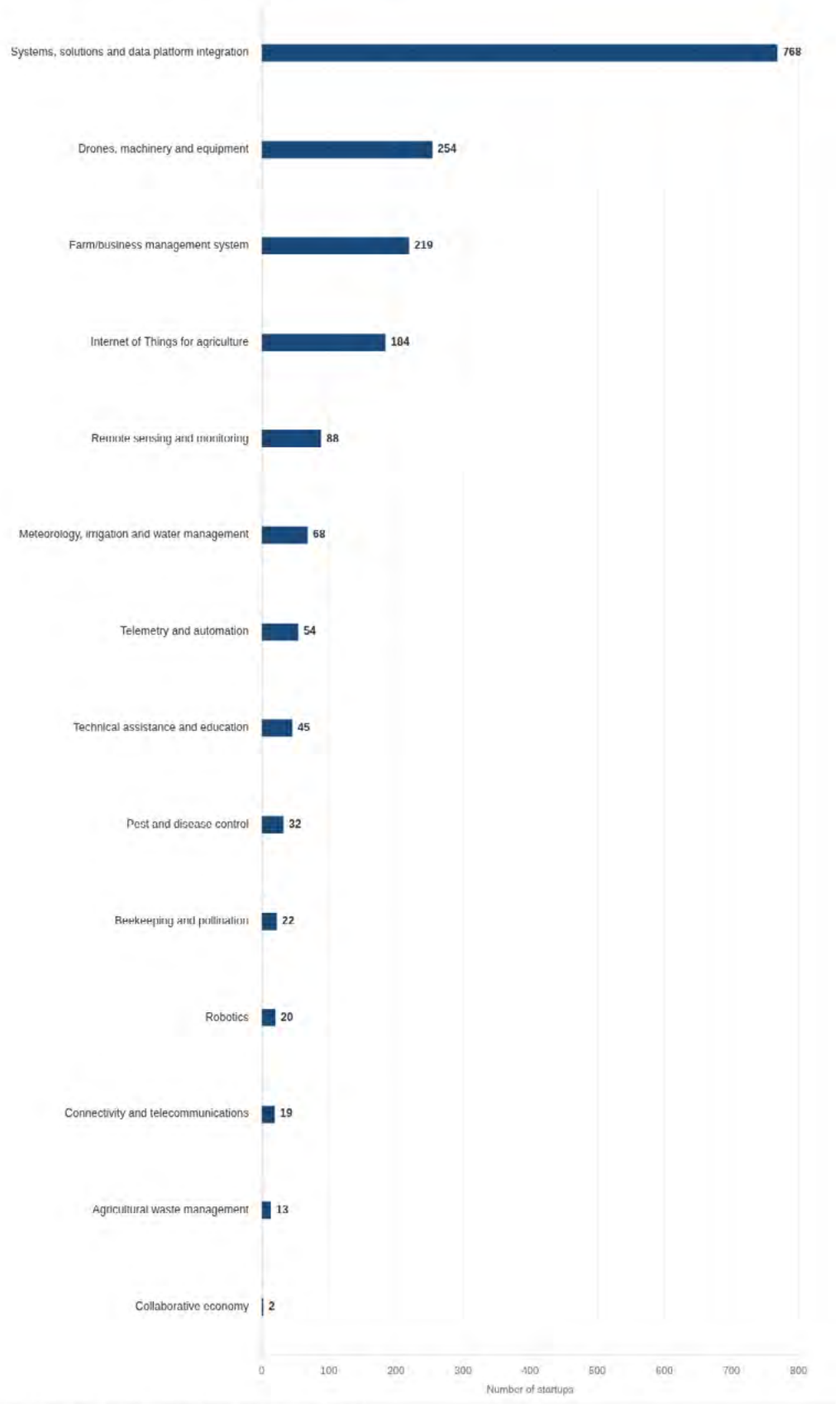
Source: Radar Agtech LAC 2026 — Embrapa, Homo Ludens, SP Ventures and IICA.

Figure 5.4B presents the categories of solutions On-Farm, allowing us to observe the diversity of applications aimed at the operation, management, monitoring and automation of production.

FIGURE 5.4B

On-Farm Categories — frequency in the mapped base

Number of startups by category within the on-farm segment · N = 2,653



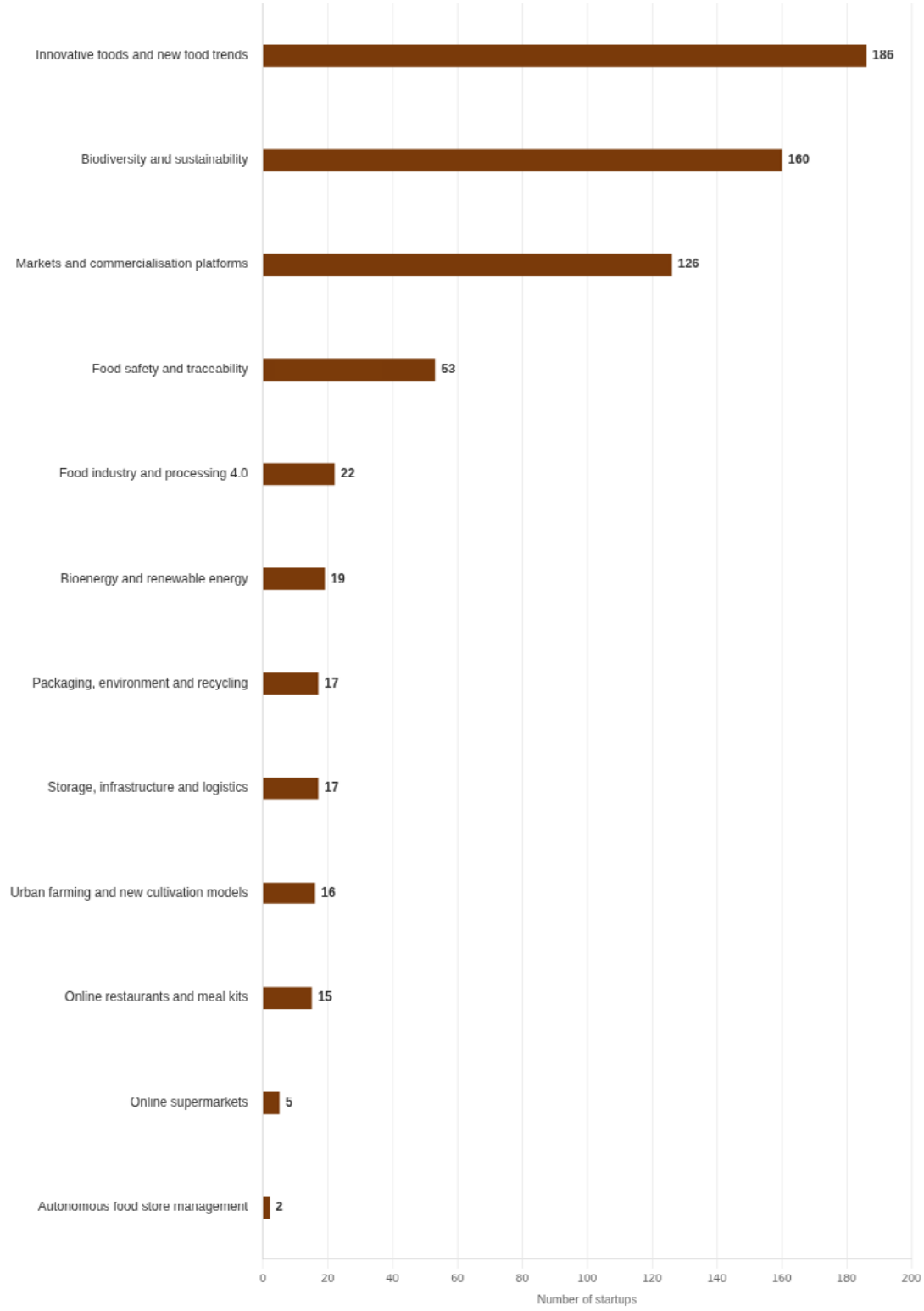
Source: Radar Agtech LAC 2026 — Embrapa, Homo Ludens, SP Ventures and IICA.

Figure 5.4C brings together the categories of solutions positioned Post-Farm, covering marketing, processing, traceability, logistics, innovative foods, and related services.

FIGURE 5.4C

Post-Farm Categories — frequency in the mapped base

Number of startups by category within the post-farm segment · N = 2,653



Source: Radar Agtech LAC 2026 — Embrapa, Homo Ludens, SP Ventures and IICA.

Among the detailed categories, the most frequent is **integration of systems, solutions, and data platforms**, with **768 occurrences**, equivalent to **28.9% of the total database** (**n = 2,653**). This category reinforces the importance of solutions aimed at the organization, integration, interoperability, analysis, and strategic use of data in agribusiness. It is followed **by fertilizers, inoculants and plant nutrition**, with **427 occurrences**, or **16.1% of the total base**, indicating a significant weight of solutions linked to inputs, plant productivity and agronomic management.

Drones, machinery and equipment **also stand out**, with **254 occurrences**, equivalent to **9.6% of the total base**; **farm/ business management system**, with **219 occurrences**, or **8.3% of the total base**; **innovative foods and new food trends**, with **186 occurrences**, or **7.0% of the total base**; **internet of things for agriculture**, with **184 occurrences**, or **6.9% of the total base**; **biodiversity and sustainability**, with **160 occurrences**, or **6.0% of the total base**; and **markets and platforms for the commercialization and sale of products and services**, with **126 occurrences**, or **4.7% of the total base**.

Other categories appear less frequently, but are relevant to understanding the diversity of the ecosystem: **remote sensing, diagnosis, and image monitoring**, with **88 occurrences**, or **3.3% of the total base**; **meteorology, irrigation and water management**, with **68 occurrences**, or **2.6% of the total base**; **seeds, seedlings and plant genomics**, with **66 occurrences**, or **2.5% of the total base**; **telemetry and automation**, with **54 occurrences**, or **2.0% of the total base**; **food safety and traceability**, with **53 occurrences**, or **2.0% of the total base**; **technical assistance, communication, content, education and social networks**, with **45 occurrences**, or **1.7% of the total base**; **credit, barter, insurance, carbon credits and fiduciary analysis**, with **45 occurrences**, or **1.7% of the total base**; **animal nutrition and health**, with **42 occurrences**, or **1.6% of the total base**; **control of pests, weeds and diseases**, with **32 occurrences**, or **1.2% of the total base**; **the market for agro inputs**, with **26 occurrences**, or **1.0% of the total base**; **beekeeping and pollination**, with **22 occurrences**, or **0.8% of the total base**; and **food industry and processing 4.0**, with **22 occurrences**, or **0.8% of the total base**.

In the regional analysis of the detailed categories, the denominator becomes the total number of startups in each subregion. In **Central America**, the top category is **systems integration, solutions, and data platforms**, with **11 occurrences**, equivalent to **40,7% of Central American startups** (**n = 27**). This is followed by **the farm/ business management system**, **remote sensing, image diagnosis and monitoring,** and **food safety and traceability**, all with **8 occurrences**, equivalent to **29.6% of the startups in the subregion** each. Also noteworthy are **the internet of things for agriculture**, with **6 occurrences**, or **22,2%,** and **drones, machinery and equipment**, **biodiversity and sustainability**, **meteorology, irrigation and water management**, and **technical assistance, communication, content, education, and social networks**, each with **4 occurrences**, or **14.8%.**

In the **Southern Cone**, the most frequent category is **integration of systems, solutions, and data platforms**, with **744 occurrences**, equivalent to **30.9% of startups in the Southern Cone** (**n = 2,404**). This is followed by **fertilizers, inoculants and plant nutrition**, with **408 occurrences**, or **17.0%**; **drones, machinery and equipment**, with **239 occurrences**, or **9.9%**; **innovative foods and new food trends**, with **173 occurrences**, or **7.2%**; **farm/ business management system**, with **168 occurrences**, or **7.0%**; **internet of things for agriculture**, with **150**

occurrences, or **6.2%**; **biodiversity and sustainability**, with **144 occurrences**, or **6.0%**; and **markets and trading platforms**, with **95 occurrences**, or **4.0%.**

In **Mexico**, the most frequent category is **the farm/ business management system**, with **19 occurrences**, equivalent to **17.6% of Mexican startups** (**n = 108**). Next come **the internet of things for agriculture**, with **15 occurrences**, or **13.9%**; **fertilizers, inoculants and plant nutrition**, with **13 occurrences**, or **12.0%**; **meteorology, irrigation and water management**, with **12 occurrences**, or **11.1%**; **biodiversity and sustainability**, with **11 occurrences**, or **10.2%**; **innovative foods and new food trends**, with **8 occurrences**, or **7.4%**; **markets and marketing platforms**, with **7 occurrences**, or **6.5%**; and **technical assistance, communication, content, education and social networks**, with **6 occurrences**, or **5.6%.**

In the **Andean Countries**, the main category is **the farm/ business management system**, with **24 occurrences**, equivalent to **22.6% of the startups in the subregion** (**n = 106**). This is followed by m**arkets and commercialization platforms**, with **19 occurrences**, or **17.9%**; **internet of things for agriculture**, with **13 occurrences**, or **12.3%**; **technical assistance, communication, content, education and social networks**, with **12 occurrences**, or **11.3%**; **remote sensing, diagnosis and image monitoring**, with **11 occurrences**, or **10.4%**; **control of pests, weeds and diseases**, with **10 occurrences**, or **9.4%**; **Data platforms and systems integration**, with **10 occurrences**, or **9.4%**; **credit, barter, insurance, carbon credits and fiduciary analysis**, with **9 occurrences**, or **8.5%**; and **telemetry and automation** and **meteorology, irrigation and water management**, both with **7 occurrences**, or **6.6%** each.

In the **Caribbean**, the base is small, with **n = 8 startups**, so the percentages should be interpreted with caution. The categories with the highest proportional presence are **urban agriculture, plant factories and new ways of planting**, **markets and platforms for marketing** and **technical assistance, communication, content, education and social networks**, each with **2 occurrences**, equivalent to **25,0% of Caribbean startups**. Drones**, machinery and equipment**, **meteorology, irrigation and water management,** and **beekeeping and pollination** also appear, each with **1 occurrence**, equivalent to **12,5% of the startups in the subregion**.

5.4 Benefits

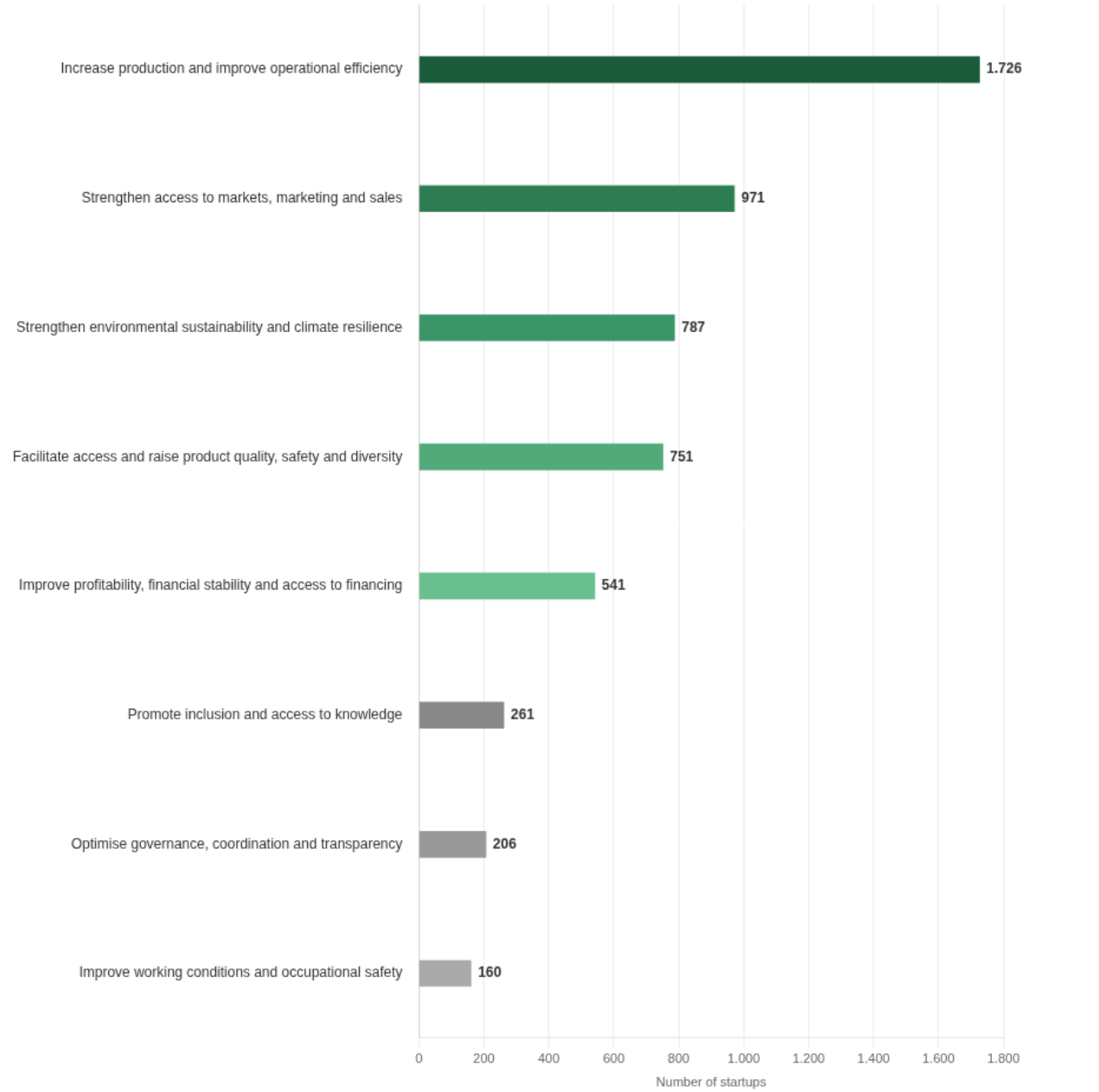
Figure 5.5 presents the benefits associated with the mapped solutions. As benefits are also non-exclusive categories, the same startup can be simultaneously associated with more than one type of expected result.

FIGURE 5.5

Benefits associated with agtech solutions

Number of startups by identified benefit · N = 2,653

Production and operational efficiency is present in 1,726 startups (65.1%). Market access (971; 36.6%), environmental sustainability and climate resilience (787; 29.7%) and product quality (751; 28.3%) form the second group. Inclusion (261; 9.8%), governance (206; 7.8%) and working conditions (160; 6.0%) signal a present social agenda. *Methodological note: values indicate the number of startups — they should not be summed.*



Source: Radar Agtech LAC 2026 — Embrapa, Homo Ludens, SP Ventures and IICA.

In terms of benefits, considering the **total base of 2,653 startups as the denominator**, the most frequent benefit is **to increase production and improve operational efficiency**, with **1,726 occurrences**, equivalent to **65.1% of the total base**. This result indicates that most of the solutions are associated with gains in productivity, efficiency, loss reduction, process improvement, or operational optimization in the agribusiness chains.

Benefits comprise the types of identified results, gains, or impacts associated with the solution, product, service, platform, process, or business model presented by the Agtech.

The second most frequent benefit is **to strengthen access to markets, marketing and sales**, with **971 occurrences**, equivalent to **36.6% of the total base**. This is followed by **strengthening environmental sustainability and climate resilience**, with **787 occurrences**, or **29.7% of the total base**; **facilitate access and increase the quality, safety and diversity of products**, with **751 occurrences**, or **28.3% of the total base**; and **improve profitability, financial stability and access to financing**, with **541 occurrences**, or **20.4% of the total base**.

Benefits associated with inclusion, governance and work also appear. **Promoting inclusion and access to knowledge** registers **261 occurrences**, equivalent to **9.8% of the total base**; **optimizing governance, coordination and transparency** has **206 occurrences**, or **7.8% of the total base**; and **improving working conditions, occupational safety and reduction of occupational risks** adds up **to 160 occurrences**, or **6.0% of the total base**. Although these benefits have a lower relative frequency, they broaden the reading of the ecosystem beyond productivity, incorporating social, institutional, and quality of work dimensions.

In the regional analysis, the benefit **of increasing production and improving operational efficiency** appears in **1,562 occurrences in the Southern Cone**, equivalent to **65.0% of the startups in the subregion (n = 2,404)**; **85 occurrences in Mexico**, or **78.7% of Mexican startups (n = 108)**; **54 occurrences in the Andean Countries**, or **50.9% of the startups in the subregion (n = 106)**; **20 occurrences in Central America**, or **74,1% of startups in the subregion (n = 27)**; and **5 occurrences in the Caribbean**, or **62,5% of Caribbean startups (n = 8)**.

The benefit **of strengthening access to markets, marketing and sales** registers **918 occurrences in the Southern Cone**, equivalent to **38.2% of the startups in the subregion (n = 2,404)**; **25 occurrences in the Andean countries**, or **23.6% (n = 106)**; **19 occurrences in Mexico**, or **17.6% (n = 108)**; **7 occurrences in Central America**, or **25,9% (n = 27)**; and **2 occurrences in the Caribbean**, or **25,0% (n = 8)**. The benefit **of strengthening environmental sustainability and climate resilience** appears in **732 occurrences in the Southern Cone**, or **30.4% of startups in the subregion**; **23 occurrences in Mexico**, or **21.3%**; **17 occurrences in the Andean Countries**, or **16.0%**; **11 occurrences in Central America**, or **40,7%**; and **4 occurrences in the Caribbean**, or **50,0%**.

The benefit **of facilitating access and increasing the quality, safety and diversity of products** has **720 occurrences in the Southern Cone**, equivalent to **30.0% of the startups in the subregion (n = 2,404)**; **17 occurrences in the Andean countries**, or **16.0% (n = 106)**; **8 occurrences in Central America**, or **29.6% (n = 27)**; **4 occurrences in the Caribbean**, or **50,0% (n = 6)**; and **2 occurrences in Mexico**, or **1.9% (n = 108)**. The benefit **of improving profitability, financial stability and access to financing** appears in **519 occurrences in the Southern Cone**, or **21.6% of startups in the subregion**; **12 occurrences in the Andean Countries**, or **11.3%**; **6 occurrences in Central America**, or **22,2%**; **4 occurrences in Mexico**, or **3.7%**; and no occurrence in the Caribbean, or **0,0%.**

6. Regional analysis of startups

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The regional distribution of startups reveals a strong concentration in the **Southern Cone,** which accounts for **2,404 startups**, equivalent to **90.6% of the total base** (**n = 2,653**). Next come **Mexico**, treated here as North **America**, with **108 startups**, or **4.1% of the total base**; the **Andean Countries**, with **106 startups**, or **4.0% of the total base**; **Central America**, with **27 startups**, or **1.0% of the total base**; and the **Caribbean**, with **8startups**, or **0.3% of the total base**. This distribution shows that the aggregate results of the base are strongly influenced by the weight of the Southern Cone, especially by Brazil.

In the ranking by country, **Brazil** concentrates **2,075 startups**, equivalent to **78.2% of the total base** (**n = 2,653**). Next come **Argentina**, with **158 startups**, or **6.0% of the total base**; **Mexico**, with **108 startups**, or **4.1%**; **Chile**, with **91 startups**, or **3.4%**; **Colombia**, with **79 startups**, or **3.0%**; and **Uruguay**, with **74 startups**, or **2.8%.** The geographic overview chart breaks down the **15 countries with the highest number of startups** by name; since the total base includes **23 countries**, there are additional countries not displayed by name in this chart.

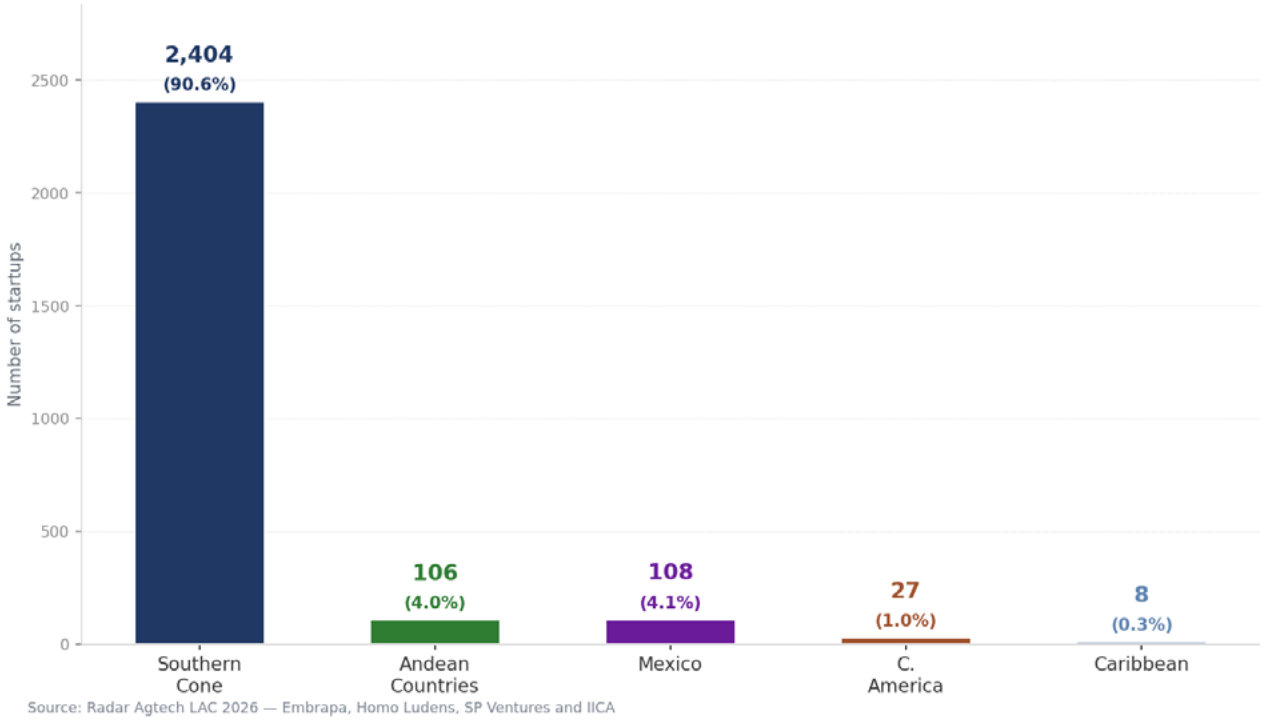
Figure 6.1 presents the geographic distribution of the startups mapped in the **Radar Agtech LAC 2026**. The proportional circles indicate the number of startups in each country, while the colors distinguish the subregional groupings adopted in the study. The figure should be interpreted with the understanding that the concentration observed in the **Southern Cone** is driven primarily by the weight of Brazil within the mapped database.

Figure 6.2 compares the presence of the main production chains by subregion and by selected countries. Each panel uses its own scale; therefore, interpretation should focus on the internal profile of each analytical unit rather than on direct comparisons between panels, rather than the direct comparison between bar sizes of different panels.

FIGURE 6.2

Number of Agtech Startups by Sub-region

Latin America and the Caribbean (LAC) · 2026 · N = 2,653 startups in 23 countries



Source: Radar Agtech LAC 2026 — Embrapa, Homo Ludens, SP Ventures and IICA

The distribution of startups across Latin America and the Caribbean is highly uneven. Brazil alone accounts for 78.2% of the total database and 86.3% of the Southern Cone sample, making it the primary driver of the aggregated results. Argentina, Mexico, Chile, Colombia, and Uruguay form a second group of countries with a stronger absolute presence in the mapped ecosystem. Central America and Caribbean subsets exhibit smaller startup bases, requiring greater caution in interpretation, as relatively small changes in the number of startups can produce substantial percentage variations.

While Chapter 5 presents the multidimensional composition of startups—including production chains, technological domains, solution categories, and benefits — Chapter 6 adds the territorial dimension to this analysis. Figures 6.2A through 6.2D provide a multidimensional view of startups across selected countries.

The data presented in Figure 6.2A compare the presence of the main production chains across selected countries. Each panel uses its own scale; therefore, interpretation should focus on the internal profile of each country rather than on direct comparisons of bar lengths across different panels.

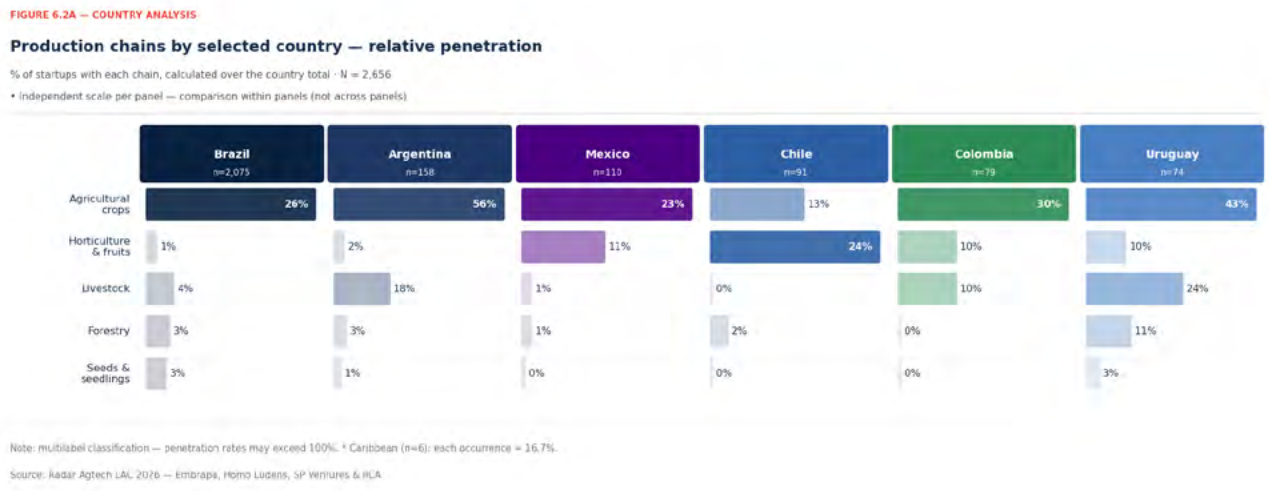


Figure 6.2B shows the technology domains by selected countries. The Figure helps to observe how the technological composition varies between the different geographic sections of the base.

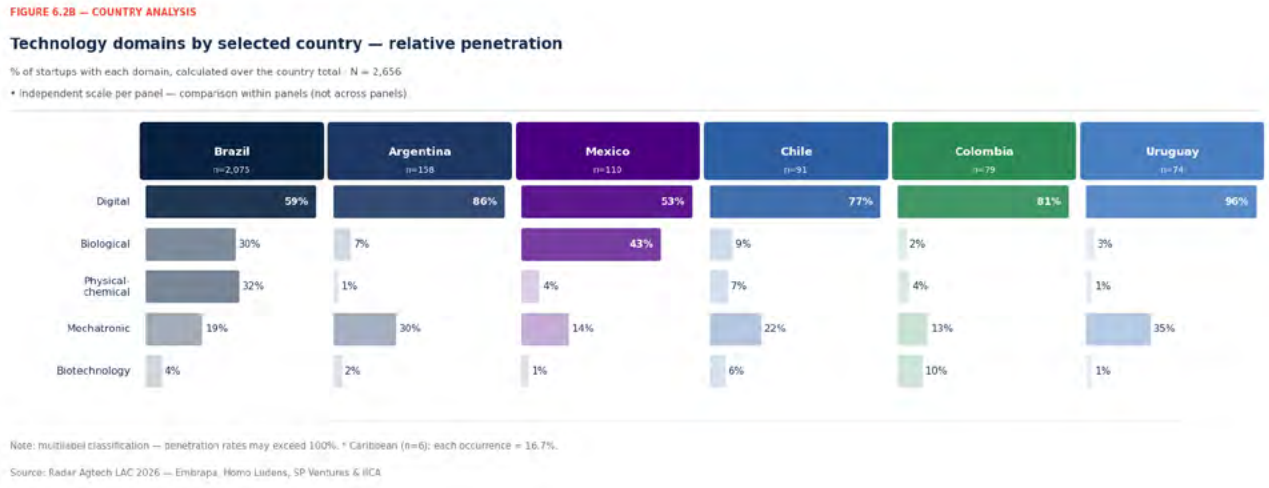


Figure 6.2C shows the positioning of solutions Pre, On, and Post-Farm by selected countries. The reading allows you to compare the internal composition of the solutions without assuming exclusivity between macrosegments.

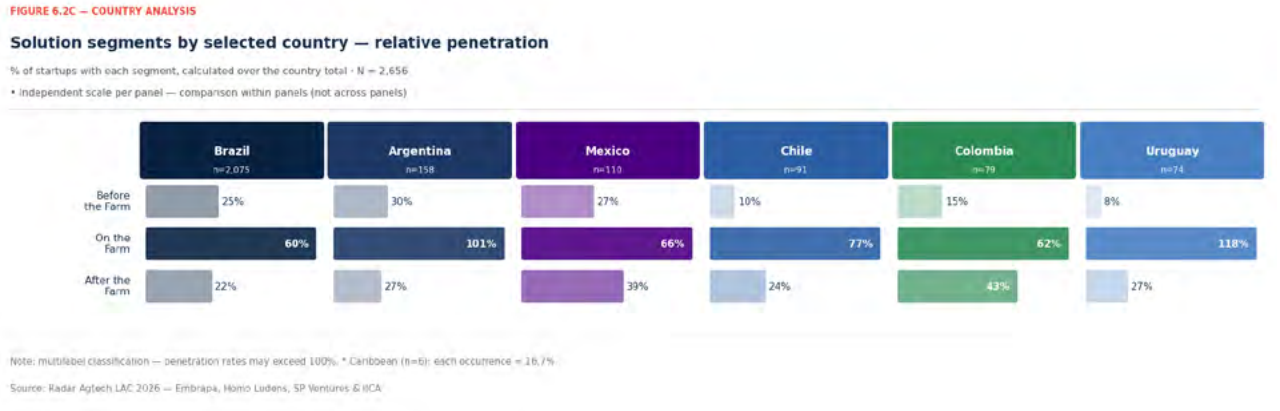


Figure 6.2D shows the benefits associated with the solutions by selected countries. The values indicate associations of benefits to startups and should be interpreted as non-exclusive categories.

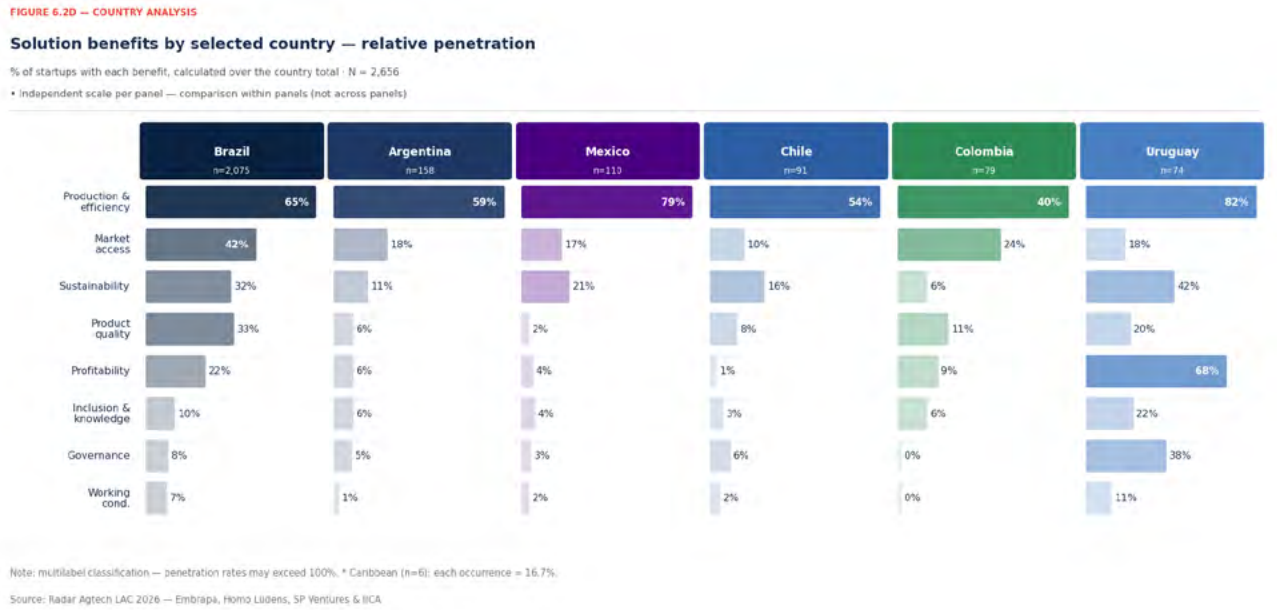
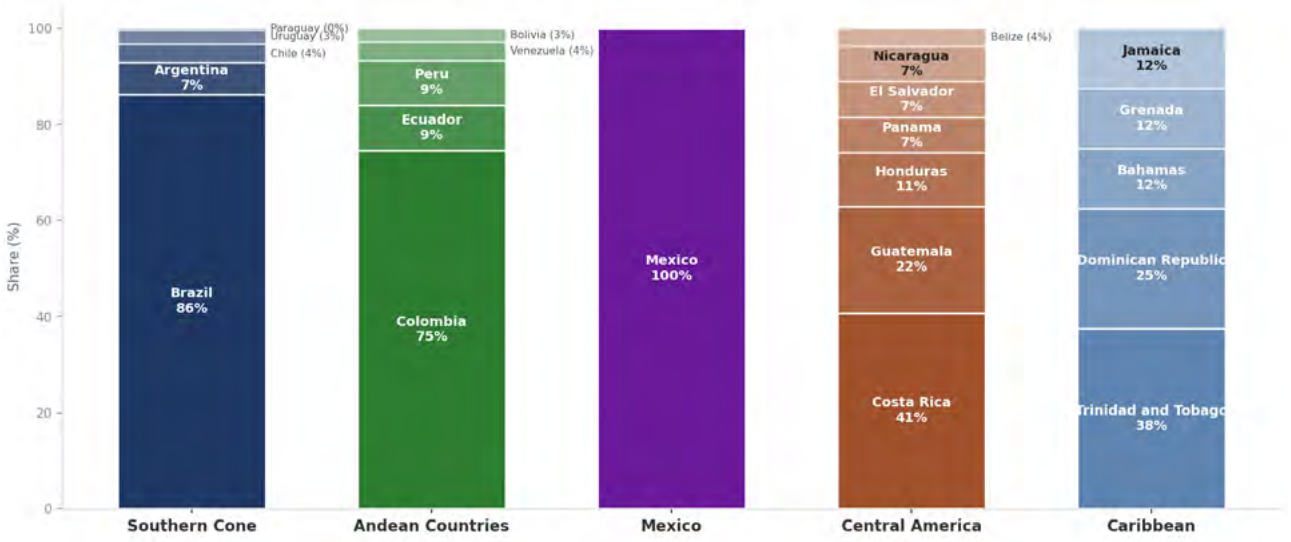


Figure 6.3 shows the technology domains by subregion and by selected countries. The Figure helps to observe how the technological composition varies between the different geographic sections of the base.

FIGURE 6.3

Share of Agtech Startups by Country within Each Sub-region

Latin America and the Caribbean (LAC) · 2026 · Percentage distribution by country



Southern Cone: 2,404 (90.6%)
Brazil (86%) · Argentina (7%) · Chile (4%) · Uruguay (3%) · Paraguay (0%)

Andean Countries: 106 (4.0%)
Colombia (75%) · Ecuador (9%) · Peru (9%) · Venezuela (4%) · Bolivia (3%)

Mexico: 108 (4.1%)
Mexico (100%)

Central America: 27 (1.0%)
Costa Rica (41%) · Guatemala (22%) · Honduras (11%) · Panama (7%) · El Salvador (7%) · Nicaragua (7%) · Belize (4%)

Caribbean: 8 (0.3%)
Trinidad and Tobago (38%) · Dominican Republic (25%) · Bahamas (12%) · Grenada (12%) · Jamaica (12%)

Source: Radar Agtech LAC 2026 — Embrapa, Homo Ludens, SP Ventures and IICA

6.1 Southern Cone

The **Southern Cone** brings together **2,404 startups**, equivalent to **90.6% of the total base (n = 2,653)**. Within the subregion itself, the distribution by country is quite concentrated in Brazil, followed by Argentina, Chile, Uruguay and Paraguay. As the countries of the Southern Cone presented in the Figure add up to exactly the **2,404 startups** in the subregion, the nominal distribution shown allows for the full coverage of this regional cut.

Brazil is the main country in the LAC database, with **2,075 startups**. This number corresponds to **78.2% of the total base (n = 2,653)** and **86.3% of the startups in the Southern Cone (n = 2,404)**. Due to this relative weight, Brazil strongly influences both the aggregate results of the base and the general profile of the Southern Cone. The regional reading should consider that many of the trends observed for the subregion reflect, to a large extent, the structure of the Brazilian base.

Argentina appears as the second country in the Southern Cone and the total base, with **158 startups**. This total is equivalent to **6.0% of the total base (n = 2,653)** and **6.6% of the startups in the Southern Cone (n = 2,404)**. Although far from the Brazilian volume, Argentina is part of the group of countries with the largest presence in the mapping and contributes to the regional density of the Southern Cone.

Chile has **91 startups**, equivalent to **3.4% of the total base (n = 2,653)** and **3.8% of the startups in the Southern Cone (n = 2,404)**. Their participation reinforce the regionally diversified character of the Southern Cone, although on a smaller scale than Brazil and Argentina.

Uruguay registers 74 startups, equivalent to **2.8% of the total base (n = 2,653)** and **3.1% of the startups in the Southern Cone (n = 2,404)**. The country appears among the six largest in the LAC database, indicating a relevant presence in the regional cut, despite its smaller population and territorial size.

Paraguay appears with **6 startups**, equivalent to **0.2% of the total base (n = 2,653)** and **0.2% of the startups in the Southern Cone (n = 2,404)**. Its presence is small compared to the other countries of the subregion, but it completes the nominal distribution of the Southern Cone shown in the Figure.

When Brazil is excluded from the analysis, the remaining Southern Cone countries account for 329 startups, representing 13.7% of the subregional total and 12.4% of the overall database. Examining this subset separately is important to avoid automatically generalizing patterns observed in Brazil to the entire subregion.

In terms of thematic profile, the Southern Cone has a predominance of **agricultural crops**, with **666 occurrences**, equivalent to **27.7% of the startups in the subregion (n = 2,404)**, in addition to a relevant presence of livestock, forest chain, seeds and seedlings, and horticulture and fruit growing. In the technological domain, digital predominates, with **1,499 occurrences**, or **62.4% of startups in the Southern Cone**, followed by physicochemical, biological and mechatronics. In the categories of solutions, the main one is **integration of systems, solutions and data platforms**, with **744 occurrences**, or **30.9% of startups in the subregion**.

6.2 Andean countries

The **Andean Countries** have **106 startups**, equivalent to **4.0% of the total base (n = 2,653)**. In the country chart, the subregion is composed of **Colombia**, **Peru**, **Ecuador**, **Venezuela** and **Bolivia**, whose totals add up to exactly the **106 startups** registered for the subregion. Therefore, the nominal distribution presented fully covers the Andean countries.

Colombia is the leading Andean country at the base, with **79 startups**. This number corresponds to **3.0% of the total base (n = 2,653)** and **74.5% of the startups in the Andean Countries (n = 106)**. The Colombian concentration means that the aggregate reading of the subregion is strongly influenced by the profile of startups located in the country.

Peru registers 10 startups, equivalent to **0.4% of the total base (n = 2,653)** and **9.4% of the startups in the Andean countries (n = 106)**. The country appears in an intermediate position within the subregion, with a share similar to that of Ecuador.

Ecuador also has **10 startups**, equivalent to **0.4% of the total base (n = 2,653)** and **9.4% of the startups in the Andean countries (n = 106)**. Like Peru, it makes up the second level of regional presence, below Colombia and above Venezuela and Bolivia.

Venezuela has **4 startups**, equivalent to **0.2% of the total base** (**n = 2,653**) and **3.8% of the startups in the Andean Countries** (**n = 106**). Its presence is reduced in absolute terms, but it contributes to the geographic diversity of the Andean region.

Bolivia registers **3 startups**, equivalent to **0.1% of the total base** (**n = 2,653**) and **2.8% of the startups in the Andean Countries** (**n = 106**). It is the smallest contingent nominally presented in the subregion, according to the country chart.

In the thematic profile, the Andean Countries have the highest presence of **agricultural crops**, with **39 occurrences**, equivalent to **36.8% of the startups in the subregion** (**n = 106**), followed by horticulture and fruit growing, livestock and aquaculture. The **digital domain** is predominant, with **78 occurrences**, or **73.6% of startups in the Andean Countries**. In the categories of solutions, **the farm/business management system stands out**, with **24 occurrences**, or **22.6% of the startups in the subregion**, followed by markets and trading platforms.

6.3 Central America

Central America accounts **for 27 startups**, representing **1.0% of the total database (n = 2,653**). Costa Rica is the leading Central American country in the database, with **11 startups.** This figure corresponds to **0.4% of the total database (n = 2,653) and 40,7% of the startups in Central America (n = 27).** Within a subregion characterized by a small absolute scale, Costa Rica concentrates the largest share of startups explicitly identified in the figure.

Guatemala registers **6 startups**, equivalent to **0.2% of the total base** (**n = 2,653**) and **22,2% of Central American startups** (**n = 27**). Its participation places it as the second most represented Central American country among the countries listed in the Figure.

Honduras appears with **3 startups**, equivalent to **0.1% of the total base** (**n = 2,653**) and **11,1% of Central American startups** (**n = 27**). Other countries with identified startups in the database were **El Salvador (2), Nicaragua (2), Panama (2)** = **7,4% each** and **Belize 3,7%**

In the thematic profile, Central America has a strong concentration in **agricultural crops**, with **21 occurrences**, equivalent to **77,8% of the startups in the subregion** (**n = 27**), followed by horticulture and fruit growing and livestock. The **digital domain** appears in **24 occurrences**, or **88.9% of Central American startups**, while the **mechatronic domain** registers **13 occurrences**, or **48,1%.** In the categories of solutions, **integration of systems, solutions and data platforms stands out**, with **11 occurrences**, or **40,7% of startups in the subregion**.

6.4 Caribbean

The **Caribbean** brings together **8 startups**, equivalent to **0.3% of the total base** (**n = 2,653**). **Trinidad and Tobago** accounts for **3 startups**, representing **0.1% of the total database (n = 2,653)** and **37,5% of the startups in the Caribbean (n = 8).** Other countries with identified startups in the database were **Dominican Republic (2)** = **25.0%, the Bahamas (1), Grenada (1), and Jamaica (1) = 12.5% each**.

In the thematic profile, the Caribbean has **3 occurrences in horticulture and fruit growing**, equivalent to **37,5% of the startups in the subregion** (**n = 8**), in addition to occurrences in agricultural crops and beekeeping and sericulture. **The digital** domain appears in **3 occurrences**, or **37,5% of Caribbean startups**, and **mechatronics** in **2 occurrences**, or **25,0%.** In the categories of solutions, urban agriculture, markets and platforms for marketing and

technical assistance, communication, content, education and social networks stand out, each with **2 occurrences**, or **25,0% of startups in the Caribbean**.

6.5 Mexico

In the LAC database, **North America** is represented by **Mexico**, with **108 startups**, equivalent to **4.1% of the total base** (**n = 2,653**) and **100.0% of the Mexico/North America regional group** (**n = 108**). For this reason, the analysis of the country fully coincides with the analysis of the subregion.

Mexico is the third country with the highest number of startups in the base, behind only Brazil and Argentina. Its **108 startups** correspond to **4.1% of the total base** and constitute the entire regional segment identified as Mexico. Mexico occupies a relevant position because it combines an intermediate scale in the LAC database with a differentiated technological profile, especially due to the relative presence of the biological domain.

In the production chains, Mexico has **25 occurrences in agricultural crops**, equivalent to **23.1% of Mexican startups** (**n = 108**), and **12 occurrences in horticulture and fruit growing**, or **11.1%.** The other chains appear with a smaller share, including livestock, forestry, beekeeping, and sericulture and aquaculture, each with **1 occurrence**, or **0.9% of Mexican startups**.

In the technological domains, Mexico has **58 occurrences in the digital domain**, equivalent to **53.7% of Mexican startups** (**n = 108**), and **45 occurrences in the biological domain**, equivalent to **41.7%.** This combination differentiates the country from other subregions, in which the digital domain predominates with less relative weight than the biological domain. In the categories of solutions, the main one is **the farm/ business management system**, with **19 occurrences**, or **17.6% of Mexican startups**, followed by **the internet of things for agriculture**, with **15 occurrences**, or **13.9%,** and **fertilizers, inoculants and plant nutrition**, with **13 occurrences**, or **12.0%.**

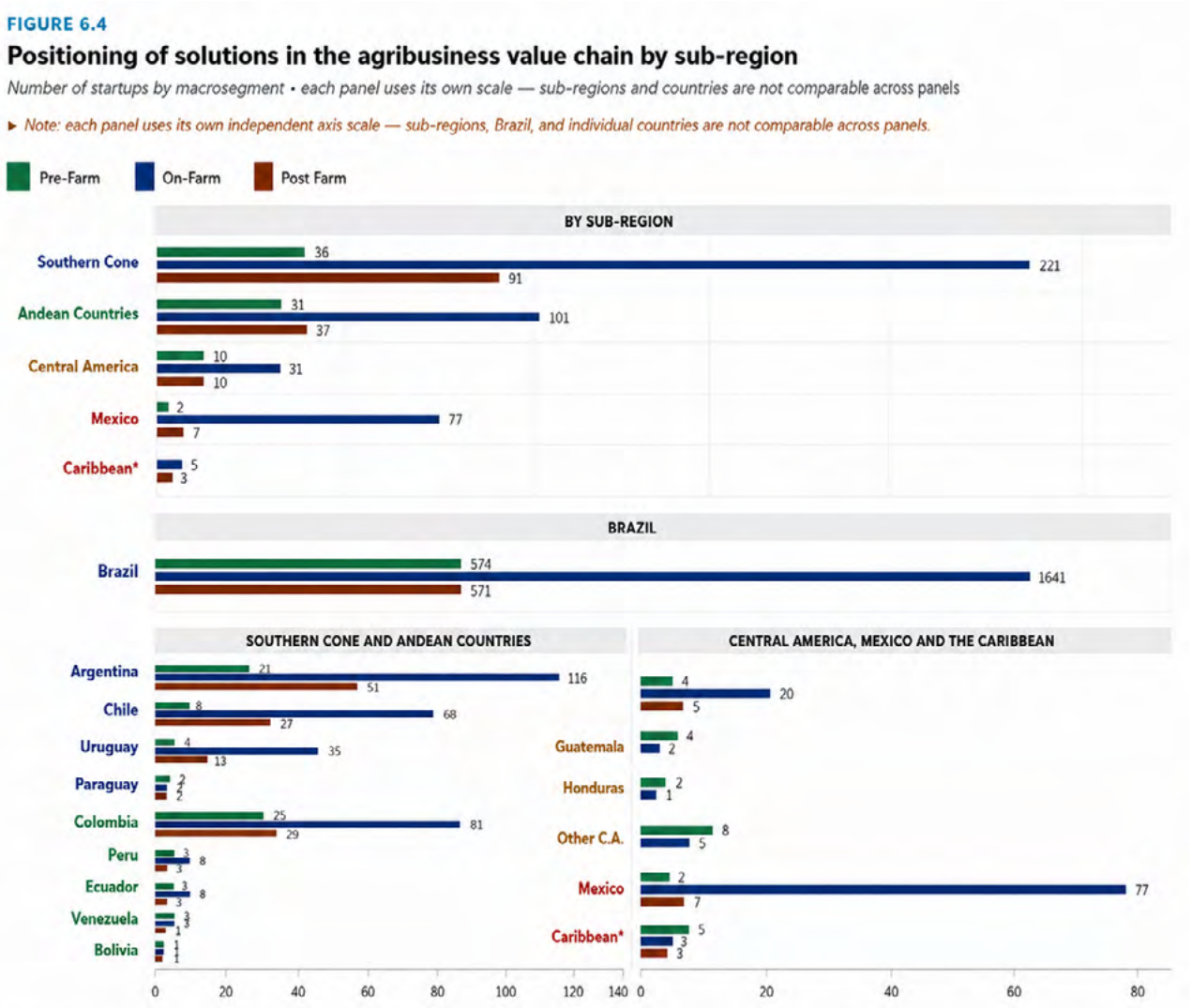
6.6 Integrated Analysis

Figure 6.4 illustrates the distribution of **Pre-Farm, On-Farm, and Post-Farm solutions** across subregions and selected countries. The figure allows for comparison of the internal composition of solutions while recognizing that the macrosegments are not mutually exclusive.

FIGURE 6.4

Positioning of solutions in the agribusiness value chain by sub-region

Number of startups by macrosegment • each panel uses its own scale — sub-regions and countries are not comparable across panels



Number of startups

Methodological note: macrosegments are not mutually exclusive — values should not be summed. Different scales by panel. BY SUB-REGION, BRAZIL, and country columns use independent axes.

Source: Radar Agtech LAC 2026 — Embrapa, Homo Ludens, SP Ventures, and IICA.

* Caribbean includes Trinidad and Tobago.

Integration of Dimensions and Vectors

- **Cross-Taxonomy** (Figure 5.1): The multi-label matrix of 34 subcategories is the starting point for the heatmaps. The concentration of "On- Farm" solutions (Figure 5.2 and Figure 6.2C) is the most transversal dimension, led by Brazil in all chains and benefits. Figure 5.3 confirms that the "Digital" domain is the predominant enabling base, with the highest intensity of cross-referencing in the heat maps, especially with "Production and Efficiency" benefits (Figure 6.2D).
- **Production Chains** (Figures 5.2 and 6.2A): The regional mix analysis reveals that, although "Agricultural Crops" is the most frequent chain, the tactical mix varies sig-

nificantly between the subregions. Brazil, due to its volume, overlaps all chains. The Southern Cone and the Andean Region show a more balanced relative specialization between agricultural crops and horticulture/fruit growing. Mexico has a focused intensity, but with lower penetration in livestock and horticulture compared to the other major regions.

- **Technology Domains** (Figures 5.3 and 6.2B): The hegemony of the "Digital" domain is evident selected countries and subregions. Figure 6.2B shows that the intensity of associations for "Digital" is the highest. Brazil and the Southern Cone lead the development of "Biological" and "Physicochemical" domains, indicating a maturation beyond pure software, especially in bioinputs and new materials. The Andean Region and Mexico show a more concentrated adoption in mechatronic domains.
- **Solution Categories** (Figures 5.4A/B/C and 6.2C): Figure 6.2C confirms that the "On-Farm" segment (led by systems integration platforms) is the primary focus. Brazil, in particular, dominates all subcategories. However, there are latent opportunities in the "Pre-Farm" segment (inputs and credit, Figure 5.4A), and "Post-Farm" (foodtechs and sustainability, Figure 5.4C). The intensity of associations for "Foodtechs" in the heat map indicates a growth in this subcategory.
- **Benefit Vectors** (Figures 5.5 and 6.2D): The "Increase Production and Improve Operational Efficiency" benefit is the main driver of associations observed in the heatmaps (Figure 6.2D), led by Brazil and followed by the Southern Cone. The benefit of "Market Access" is also highly intense. Sustainability and product quality show more focused association intensities. The promotion of social inclusion and occupational safety has lower intersection intensities, indicating windows of opportunity for greater impact density.

The heatmaps and analyses in Chapters 5 and 6 demonstrate that Agtech innovation in Latin America and the Caribbean is a concentrated and tactically transversal phenomenon, where operational efficiency and the digital base are the the most prominent drivers associated with ecosystem presence and observed impact patterns.

FIGURE 6.4A — REGIONAL SYNTHESIS

Production chains by sub-region — internal relative penetration

% of startups in each chain, calculated over the sub-region total · N = 2,653

• Scale normalized by column — maximum intensity represents each sub-region's highest value

	Southern Cone n=2,404	Andean Countries n=106	C. America n=27	Mexico n=108	Caribbean n=8
Crops	28%	37%	78%	23%	13%
Horticulture & fruit growing	2%	14%	22%	11%	38%
Livestock	5%	8%	11%	1%	0%
Forestry	3%	2%	0%	1%	0%
Seeds & seedlings	2%	0%	0%	0%	0%

Note: multilabel classification — penetration may exceed 100%. Southern Cone includes Brazil.

Source: Radar Agtech LAC 2026 — Embrapa, Homo Ludens, SP Ventures and IICA

FIGURA 6.4B — SÍNTESIS REGIONAL

Dominios tecnológicos por subregión — penetración relativa interna

% de startups con cada dominio, calculado sobre el total de la subregión · N = 2.653

• Escala normalizada por columna — la intensidad máxima representa el valor más alto de cada subregión

	Cono Sur n=2.404	Países Andinos n=106	Am. Central n=27	México n=108	Caribe n=8
Digital	62%	74%	85%	53%	50%
Biológico	27%	4%	4%	43%	12%
Físico-químico	28%	3%	7%	5%	12%
Mecatrónico	20%	17%	48%	14%	25%
Biotecnología	4%	8%	0%	1%	0%

Nota: clasificación multietiqueta — la penetración puede exceder 100%. Cono Sur incluye Brasil.

Fuente: Radar Agtech LAC 2026 — Embrapa, Homo Ludens, SP Ventures e IICA

FIGURE 6.4C — REGIONAL SYNTHESIS

Solution segments by sub-region — internal relative penetration

% of startups with each segment, calculated over the sub-region total · N = 2,656
• Column-normalized scale — maximum intensity represents the highest value within each sub-region

	Southern Cone n=2,405	Andean Countries n=106	Central Am. n=27	Mexico n=110	Caribbean n=8
Pre-farm	24%	15%	7%	27%	0%
On-farm	59%	58%	93%	45%	75%
Post-farm	22%	34%	41%	38%	75%

Note: multiple classification — total may exceed 100%.
Source: Radar Agtech LAC 2026 — Embrapa, Homo Ludens, SP Ventures, and IICA

FIGURE 6.4D — REGIONAL SYNTHESIS

Solution benefits by sub-region — internal relative penetration

% of startups with each benefit, calculated over the sub-region total · N = 2,653

• Scale normalized by column — maximum intensity represents each sub-region's highest value

	Southern Cone n=2,404	Andean Countries n=106	C. America n=27	Mexico n=108	Caribbean n=8
Production & efficiency	65%	51%	70%	79%	75%
Market access	38%	24%	22%	17%	38%
Climate sustainability	30%	16%	41%	21%	50%
Product quality	30%	16%	26%	2%	62%
Profitability & financing	22%	11%	22%	4%	0%
Inclusion & knowledge	10%	13%	11%	5%	50%
Governance & transparency	8%	4%	7%	3%	0%
Working conditions	7%	1%	0%	2%	0%

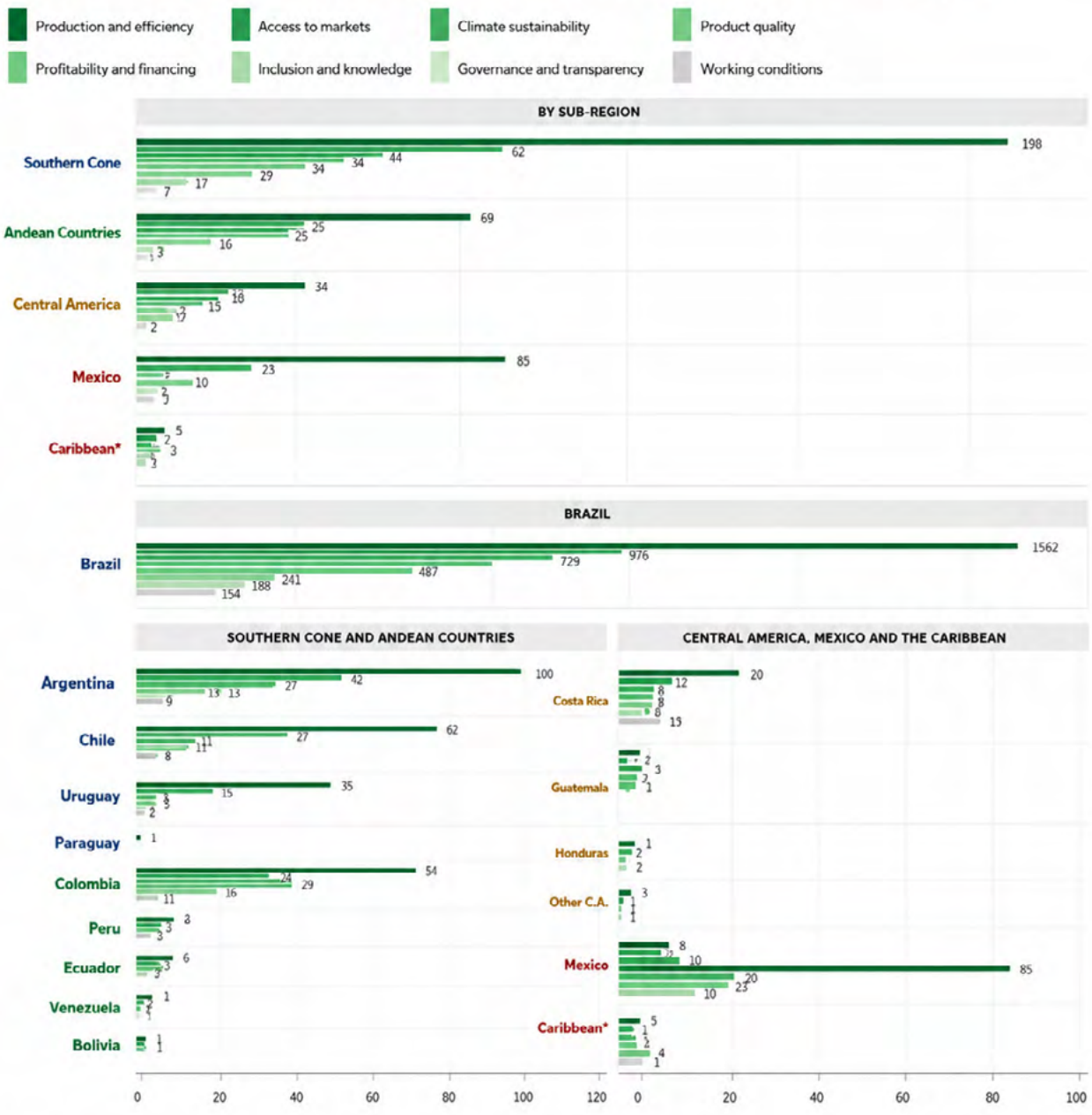
Figure 6.5 presents the benefits associated with startup solutions across subregions and selected countries. The values represent benefit-to-startup associations and should be interpreted as non-mutually exclusive categories.

FIGURE 6.5

Benefits of solutions by sub-region — number of startups per benefit

Number of startups per benefit • each panel uses its own independent scale — sub-regions and countries are not comparable across panels

▸ Note: each panel uses its own axis scale and values indicate associations of benefits to startups and should be interpreted as non-exclusive categories.



Number of startups

Methodological note: multi-benefit classification — values indicate number of startups per benefit; should not be summed.
Different scales by panel: BY SUB-REGION, BRAZIL, and country columns use independent axes.

Source: Radar Agtech LAC 2026 — Embrapa, Homo Ludens, SP Ventures, and IICA.

* Caribbean includes Trinidad and Tobago.

7. Conclusion

• *Aurélio Martins Favarin, Federico Bert and Luiz Ojima Sakuda*

The 2026 edition of the Radar Agtech LAC confirms that Latin America and the Caribbean are consolidating their position as one of the most relevant regions for the future of global agricultural innovation. By mapping 2,653 startups across 23 countries, the study offers a comprehensive view of an ecosystem that combines production scale, territorial diversity, and a growing capacity to generate technological solutions aimed at addressing the challenges of contemporary agriculture.

The results show that the development of agri-food innovation in the region still exhibits a strong geographic concentration. The Southern Cone accounts for more than 90% of the identified startups, driven primarily by Brazil's leadership, which represents about 78% of the mapped database. However, the analysis also reveals consistent signs of strengthening ecosystems in the Andean Countries, Central America, the Caribbean, and Mexico, indicating that regional agricultural innovation is gradually expanding beyond its historically more established hubs.

This trend demonstrates that innovation in Latin American agriculture is not an isolated phenomenon or one restricted to a few countries. On the contrary, the formation of local technological entrepreneurship capabilities is observed across different productive, climatic, and institutional contexts. Although at different stages of maturity, regional ecosystems share similar challenges and seek solutions capable of boosting productivity, increasing sustainability, and strengthening the competitiveness of agri-food chains.

The multidimensional analysis adopted by Radar Agtech LAC has revealed that digital transformation remains the primary technological driver of regional innovation. Solutions related to data-driven management, precision agriculture, artificial intelligence, connectivity, automation, and digital platforms occupy a prominent position in the ecosystem. At the same time, the relevance of biological, physicochemical, mechatronic, and biotechnological technologies is growing, highlighting a process of technological diversification that expands the possibilities for value creation in the sector.

Another key aspect is the prevalence of solutions focused on the production environment, particularly those related to property management, monitoring, data integration, mechanization, bio-inputs, and decision-making support. This finding demonstrates that a significant portion of the region's innovative efforts continues to be directed toward addressing challenges directly associated with agricultural production, contributing to gains in operational efficiency and increased competitiveness of production systems.

An analysis of the benefits associated with startups reinforces this perception. The mapped solutions are strongly oriented toward increasing production and operational efficiency, but they also make significant contributions to market access, environmental sustainability, climate resilience, agri-food product quality, productive inclusion, and access to financing. This diversity of benefits highlights that regional innovation transcends the productive dimension, contributing equally to addressing economic, social, and environmental challenges.

The results also reveal that Latin America and the Caribbean possess unique conditions to expand their relevance in the global agri-food innovation landscape. The combination of

abundant natural resources, biodiversity, productive capacity, availability of renewable energy, and growing technological development creates a favorable environment for generating solutions capable of simultaneously addressing demands for productivity, sustainability, and adaptation to climate change.

Despite these advances, significant structural challenges remain. The fragmentation of innovation ecosystems still limits the potential for regional integration, hindering the flow of knowledge, capital, technologies, and business opportunities. In many cases, startups, investors, research institutions, universities, innovation-promoting environments, and public organizations continue to operate in a relatively disconnected manner, reducing the possibilities for generating synergies on a Latin American scale.

In this context, regional cooperation initiatives are taking on an increasingly strategic role. Initiatives such as the PROCISUR Protocol for the Verification and Validation of Agtech Digital Solutions demonstrate that the development of common standards, shared validation mechanisms, and institutional coordination tools can help accelerate technology adoption, reduce risks, and strengthen trust among the various ecosystem stakeholders.

Similarly, the cases presented throughout the study show that the strengthening of innovation ecosystems depends not only on the emergence of new technologies but also on the existence of environments capable of connecting scientific research, entrepreneurship, financing, technical validation, and adoption by production chains. The sustainable development of regional agricultural innovation therefore requires continuous investments in governance, institutional coordination, and collaboration mechanisms.

More than just a survey of startups, the Radar Agtech LAC consolidates a regional strategic intelligence infrastructure. Its contribution lies in its ability to organize scattered information, structure common taxonomies, reduce information asymmetries, and increase the visibility of the different actors that make up the agri-food innovation ecosystem in Latin America and the Caribbean.

The consolidation of a comparable regional database creates conditions for the development of more robust analyses, the formulation of more effective public policies, and the identification of opportunities for investment and open innovation. Furthermore, it strengthens the capacity of countries in the region to act in a coordinated manner in the face of global challenges related to food security, sustainability, climate change, and the digital transformation of agriculture.

The collaboration among Embrapa, IICA, SP Ventures, and Homo Ludens significantly expands the reach of the initiative and reinforces its role as a regional instrument for knowledge generation, ecosystem integration, and innovation promotion. This convergence of expertise allows the Radar Agtech LAC to move beyond mapping, establishing itself as a platform focused on knowledge generation, connecting stakeholders, and promoting the development of the regional innovation ecosystem.

The results of this edition show that the region already has a solid foundation of technological entrepreneurship applied to agriculture. The next challenge is to expand the connection between national ecosystems, accelerate the flow of knowledge and capital, strengthen mechanisms for international cooperation, and create conditions for locally developed solutions to reach regional and global scale.

Given the growing importance of Latin America and the Caribbean for global production of food, bioenergy, fibers, and biomaterials, understanding the dynamics of its innovation ecosystem is no longer merely an analytical exercise but has become a strategic element for the region's development. The Radar Agtech LAC contributes to this goal by offering a structured overview of existing capabilities, supporting decision-making, and strengthening the foundations for an increasingly innovative, sustainable, integrated, and competitive agriculture sector.

8. References

Brazilian Cooperation Agency. (2021). **History of cooperation between Brazil and the FAO in Latin America and the Caribbean**. Ministry of Foreign Affairs. https://www.gov.br/abc/pt-br/centrais-de-conteudo/publicacoes/documentos/trajetoria-da-cooperacao-entre-o-brasil-e-a-fao-na-america-latina-e-no-caribeai.pdf

BRAZIL. **Decree No. 9,283, of February 7, 2018**. Official Gazette of the Union: Section 1, Brasília, DF, Feb. 8, 2018. Available at: http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2018/decreto/d9283.htm. Accessed on: May 29, 2026.

Calderón, F.; Tallarico, G.; Mondo, V.; Best, S.; Carrillo, H.; Tiscornia, G. 2025. **PROCISUR Protocol for the Verification and Validation of Digital AgTech Solutions**. Inter-American Institute for Cooperation on Agriculture — IICA / PROCISUR. https://www.procisur.org.uy/documento/protocolo-procisur-de-verificacion-y-validacion-de-soluciones-digitales-agtech/

Economic Commission for Latin America and the Caribbean. (2024). **Economic Commission for Latin America and the Caribbean (ECLAC)**. United Nations. https://www.cepal.org/pt-br

Food and Agriculture Organization of the United Nations. (2024). FAO Regional Office for Latin America and the Caribbean. FAO. https://www.fao.org/americas/pt/

Food and Agriculture Organization of the United Nations. (2019). **80% of agricultural production in Latin America and the Caribbean comes from family farming**. United Nations in Brazil. https://brasil.un.org/pt-br/66175-fao-80-da-explora%C3%A7%C3%A3o-agropecu%C3%A1ria-na-am%C3%A9rica-latina-e-caribe-vem-da-agricultura-familiar

Institute of Applied Economic Research. (2014). **Family farming in Brazil, Latin America, and the Caribbean: comparative analysis and perspectives**. IPEA. https://repositorio.ipea.gov.br/bitstreams/cb2924db-57f2-4ec2-b359-c024c763ee44/download

9. Annex I - Methodological Controls

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9.1 Objective

This annex documents the methodological controls adopted in the five stages of the process described in the method chapter. Its purpose is to allow a critical reading of the results without reproducing internal operational elements of the project.

The annex complements the method chapter and brings together information on data subsets, geographic coverage, classification with multiple categories, the use of generative AI as support for classification, complementary tests, consistency of the category structure, and interpretation considerations.

9.2 Data Subsets

During the development of the study, different data subsets were used for distinct purposes. The final database, with 2,653 startups, supports all analyses in the report. In parallel, auxiliary subsets were used for AI-assisted classification tests and to verify the consistency of the category structure.

These subsets do not represent competing counts from the same database. They correspond to different stages and purposes of the process.

Table 1. Data subsets used in the methodological process of Radar Agtech LAC

Subset	Size	Purpose
Final database of Radar Agtech LAC	2,653	Regional and multidimensional analyses in the report
Auxiliary database to support classification	2,570	AI-assisted classification tests and analysis of the category structure
Subset with valid textual description	1,491	Large-scale tests with generative AI
Performance evaluation set	124	Preliminary evaluation of assisted classification, with records previously classified by specialists
Consistency verification set	210	Verification of the recurrence and stability of categories across different subsets

The difference between 2,653 and 2,570 records stems from different versions and purposes: the first is the final database consolidated for substantive analysis in the report; the second is an auxiliary database used in complementary tests. Likewise, the sets of 124 and 210 verification examples were used for different purposes: evaluation of the classification method and analysis of the consistency of the category structure.

For large-scale tests with generative AI, a subset of the auxiliary database with sufficient textual descriptions for classification was used. This filter resulted in 1,491 valid records for the tests.

9.3 Geographic Coverage

The geographic scope of the study and the country-level inclusion criteria are described in the method chapter. This section records complementary information on geographic coverage that guides the reading of the quantitative analyses.

The United States and Canada are not part of the study scope because they do not fall within the operational definition of Latin America and the Caribbean used in the report. Mexico was maintained as a separate segment, identified in the tables and analyses as "Mexico".

9.4 Agtech Americas Reference Taxonomy

The Agtech Americas platform, organized by IICA, was considered one of the external references for defining the analytical structure of Radar Agtech LAC. The platform organizes Agtechs according to dimensions such as sectors, subsectors, technologies, and benefits/impacts, which are also reflected in the public profiles of the companies.

Table 2. Agtech Americas reference taxonomy considered in Radar Agtech LAC

Agtech Americas dimension	Categories
Sectors	Agribusiness, agricultural marketing and finance; agricultural data management and assessment tools; food products and services; livestock systems; crop production; industrial processes and materials; indoor production; human resources.
Subsectors	Credit and financing; insurance and risk management; technical assistance; sales and market access; investment; agronomic data; livestock data; industrial data; markets and finance; soil improvement; logistics and operations; fertilizers; climate and weather; alternative food products; food preservation; food supply chain logistics; livestock feed; animal production niche; smart technology and machinery; sales platforms; genetic and non-genetic plant improvements; pesticides; seed treatment; water management and irrigation systems; new machinery and machinery improvements; water and sanitation; renewable energy; chemical applications; indoor production systems; weather-resistant buildings; training and capacity building.
Technologies	B-Corp; drones; satellites; sensors; IoT; artificial intelligence; software; blockchain; hardware/machinery; chemistry and biology.

Agtech Americas dimension	Categories
Benefits/impacts	Buying and selling products online; accurate information for decision-making; virtual consulting; educational advisory and training; increased efficiency and productivity of operations; higher profitability and return on investment; access to credit and the financial market; optimization of resource use; improved yields; carbon sequestration; reduction of environmental impacts; satisfaction of labor needs; emissions offsetting; improvement of final products or production inputs; buying and selling services online; creation of market and supply-chain linkages; replacement of products with more sustainable alternatives; improvement of risk management practices; investment in commodities and agricultural assets; resource conservation; implementation of proven digital solutions in operations; improvement of crop management practices; quantification of the effectiveness of agricultural practices; genetic improvements for greater resilience; reduction of food waste in the supply chain; improvement of industrial processes.

The B-Corp category was preserved for fidelity to the Agtech Americas reference taxonomy, although it corresponds more properly to an organizational certification or attribute than to a technology in the strict sense. The correspondence between the Agtech Americas taxonomy and the Radar Agtech LAC structure is indicative and partial, because the two structures were built for different purposes.

9.5 Classification with Multiple Categories

The logic of classification with multiple categories is described in the method chapter. This section records the most direct methodological consequence: percentages associated with the analytical dimensions should not be added together, because each category can be assigned to the same startup independently of the others. A percentage indicating the presence of a given technology domain, chain, category, or benefit indicates the proportion of startups to which that category was assigned — and not an exclusive share of the database.

9.6 Generative AI-assisted Classification

The classification of startups was supported by generative AI tools based on large language models. The procedure consisted of providing the system with the public descriptions of the startups, the classification criteria defined by the team, and previously validated examples, obtaining preliminary category assignments across the four analytical dimensions.

AI-assisted outputs were accepted when they were consistent with the startup public description, adhered to the established criteria, and were compatible with similar cases already reviewed. Ambiguous, incomplete, or inconsistent cases were submitted to technical review.

In the public version of the report, generative AI is described at the methodological level. Complete prompts, parameters, internal rules for selecting examples, and other operational elements of the process are not presented, because they are part of the internal development and curation procedures of the project.

9.7 Complementary Tests of Assisted Classification

Complementary tests were conducted to assess the feasibility of using generative AI to classify startups. These tests compared strategies based on structured instructions, examples previously classified by specialists, and the combination of instructions and examples.

The set of 124 companies previously classified by specialists was used as the initial corpus for verification and preliminary evaluation of assisted classification. At a later stage, a large-scale experiment was conducted using separate training and test sets. The evaluation of 397 records corresponds to the test set separated from the subset of 1,491 records with valid textual descriptions.

The metric used was micro F1, appropriate for classifications with non-mutually exclusive categories and unequal distribution across categories. The results of the best configuration were:

Table 3. Results of complementary tests of generative AI-assisted classification

Analytical dimension	Micro F1 - best configuration
Technology domains	70.2%
Production chains	59.8%
Benefits	56.9%
Solution categories	35.9%

These results indicated that generative AI can support classification, especially in dimensions with clearer semantic boundaries and fewer categories, such as technology domains. The lower relative performance in solution categories may be associated with the greater granularity of the taxonomy, the conceptual overlap between categories, and the greater dependence on sector-specific context for disambiguation. This result reinforces the need for technical review in this dimension.

The tests should not be interpreted as a complete statistical audit of the final database. They serve to document the usefulness and limits of assisted classification and to guide process improvements.

9.8 Consistency of the Category Structure

A consistency analysis of the categories was conducted between verification sets and the expanded auxiliary database, with the objective of identifying recurrent categories, categories present only in smaller sets, and emerging categories as the database expanded.

In the comparison between the verification set and the expanded auxiliary database, a predominance of recurrent categories was observed in the main dimensions. In the complete set, 13 of the 14 production chain categories, the 5 technology domain categories present in the auxiliary database, 33 of the 34 solution categories, and all 8 benefit categories were retained. Rare or emerging categories were also identified, as expected in heterogeneous and expanding databases.

These results indicate that the classification structure presents relevant consistency for descriptive purposes, but also requires continuous updating, especially in less frequent solution categories and production chains.

9.9 Interpretation Considerations

The concentration of the database in the Southern Cone and Brazil conditions the interpretation of aggregate results for the LAC region. Brazil accounts for approximately 78.2% of the final database, which strongly influences the patterns observed for the region. Segments with lower volume — the Caribbean, with 8 startups, and Central America, with 27 startups — are especially sensitive to small absolute variations, which can produce large percentage differences.

Indicators normalized by population and GDP complement the reading by absolute volume, but they do not measure ecosystem maturity, quality, technological sophistication, or impact. They should be used as auxiliary metrics of relative intensity.

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