Guidebook for the development of a startup ecosystem in Agriculture & Food

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THE WORLD BANK
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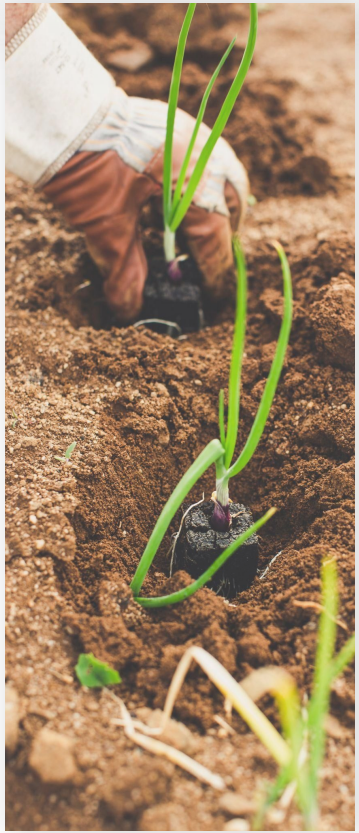
1. Introduction

Introduction



Purpose of the guidebook

This guidebook has been designed to enlighten and inform key actors in the agricultural technology (AgTech) sector. It aims to facilitate the development and growth of AgTech startup ecosystems, transforming the food system by harnessing innovative technologies and boosting private sector capabilities. Drawing on best practices and instructive use cases, this resource aims to enable the World Bank and its client countries to understand the types of investment needed, the activities to be supported, and the key local and global players with whom to collaborate to accomplish this ambitious project.

Who is it for

This guidebook is specifically written for World Bank operational staff who are expected to provide policy recommendations to client countries. It also serves as a valuable resource for a broader audience, including government entities, investors, AgTech entrepreneurs, innovators, and researchers seeking to understand and engage with AgTech startup ecosystems. By providing concrete enablers, this guide helps all of these stakeholders make informed decisions, create meaningful partnerships, and ultimately catalyse the growth of the agricultural sector around the world.

Glossary

Accelerator : A business accelerator is similar to an incubator but differs in that it usually has a greater focus on companies entering or growing in a national or global market. Business accelerators will generally offer all the services offered by a business incubator. A major difference is the level of hands-on involvement by accelerator management, which should increase the chances of success.

Data : Quantities, characteristics, symbols, or information, usually numerical, that are collected through observation and used as a basis for reasoning, discussion, or calculation.

DFI : Development Finance Institution refers to a specialized financial institution that provides funding and support for economic development projects in developing countries. DFIs are usually government-owned or supported entities, although some are private or public-private partnerships.

Digital agriculture : The collection of tools that collect, store, analyze, optimize, and share digital information along the entire food value chain, from farm to fork. It encompasses the links of a diversifying and rapidly expanding spectrum of digital technologies across different value chain segments and is anchored around data generation and (often interrelated) data systems.

Digital platform : A place that brings together stakeholders in the agrifood system to exchange information, goods, and services through digital technologies, such as mobile phones, computers, internet kiosks, and so on. Common features of digital platforms include network effects and a large scale (or scale-up potential).

Digital services : Services (transactions devices in which no physical goods are transferred from the seller to the buyer) delivered via the internet or electronic network across platforms. Digital services typically require little to no human intervention.

E-learning: Also electronic learning, the use of electronic technologies to deliver, facilitate, and enhance both formal and informal learning and knowledge sharing at any time, in any place, and at any pace.

Impact investment : Investments made with the intention of generating positive social and environmental impacts, alongside financial returns, supporting start-ups and enterprises that address sustainability challenges or social issues.

Incubator : Refers to a facility with a program to help small companies improve their chance of survival through the start-up phase. An incubator may offer services such as office space (usually at a reduced rate), shared office services: receptionist, conference rooms, computers, office equipment, and so on, entrepreneurial advice and mentoring, business planning, contacts, and networking.

Innovation ecosystem : An interconnected network of organizations, institutions, and individuals that collaborate and interact to promote innovation, entrepreneurship, and knowledge exchange within a specific industry or region.

Sources : Investopia

Glossary

Internal rate of return (IRR) : Measurement of the average annualized rate of return of an investment consisting of negative flows (cash outflows) and positive flows (cash inflows). It is used to measure and monitor the performance of PE transactions.

Internet of things (IoT) : The interconnection via the internet of computing devices embedded in everyday objects and mechanical and digital machines provided with unique identifiers, enabling data transfer over a network without human-to-human or human-to-computer interaction.

MOU : A memorandum of understanding is an agreement between two or more parties outlined in a formal document. It is not necessarily legally binding, which depends on the signatories' intent and the language in the agreement, but signals the willingness of the parties to move forward with a contract.

Proof of Concept (POC) : A demonstration or prototype that is created to determine the feasibility and viability of an idea or concept. A POC is typically a small-scale, limited implementation of a product, system, or technology that aims to validate its potential before investing significant resources into its development.

Precision farming : Also precision agriculture or satellite farming, the site-specific management of crop production inputs such as seed, fertilizer, lime, pesticides, and so on by observing, measuring, and responding to intra and inter field crop variability. Precision farming aims to increase profits, reduce waste, and maintain environmental sustainability.

Robotics : An interdisciplinary branch of technology that deals with the design, construction, and application of robots, as well as computing systems for their perception, control, sensory feedback, and information processing.

Return on investment (ROI) : A performance measure used to evaluate the efficiency or profitability of an investment or compare the efficiency of a number of different investments.

Scalability : The ability of a start-up to grow its operations, expand its customer base, and increase its revenue without a proportional increase in costs, enabling rapid growth and market penetration.

Startup : A young company that is in the early stages of its development, typically founded by one or more entrepreneurs who aim to introduce innovative products, services, or business models into the market. Startups often operate in sectors characterized by rapid technological advancements and disruptive potential. Startups are focused on growth and scalability. Startups are driven by the ambition to achieve substantial and often rapid expansion. Startups commonly employ innovative strategies, leverage technology, and utilize agile approaches to adapt to changing market conditions and gain a competitive edge.

Venture Capital : Start-up, growth equity capital, or loan capital provided by private investors (the venture capitalists) or specialized financial institutions (development finance houses or VC firms). It is also called risk capital.

Sources : Investopia

2. Context

Definition of AgTech and its key role in solving current challenges

DEFINITION

Agricultural technology, more commonly known as AgTech, is an emerging field that combines advanced technology and innovative practices to revolutionize farming and agriculture. It leverages modern advancements such as artificial intelligence (AI), the Internet of Things (IoT), big data, robotics and more to provide technological solutions to age-old challenges in agriculture.

OVERVIEW

The sector has benefited from significant investment, with external capital flowing into the upstream agricultural and food technology industry at around $18.2 billion in 2021. It represents a significant growth of 38% year on year since 2013. Worldwide, there are more than 110 AgTech unicorns, including almost 50 American and 26 Chinese. Most of these are in the delivery sector (50% of them to date). Fundraising in the AgTech and FoodTech sectors accounts for 7% of fundraising in all sectors combined, which is almost half of what these sectors account for in the global economy (between 13% and 14%, according to the World Economic Forum).

OBJECTIVES

AgTech is playing a crucial role in addressing the urgent challenges facing agriculture and driving new industrial policies within the economy. It introduces disruptive elements, with startups acting as catalysts for leapfrogging, similar to the transformative impact seen with FinTech in Africa. Using innovative technologies and approaches, AgTech aims to solve long-standing problems that traditional agricultural solutions have struggled to address.

Its primary objective is dual: to respond to the urgent need to increase agricultural yields and to promote the development of sustainable agricultural practices. The immense potential of AgTech to revolutionise the sector is crucial for ensuring global food security.

Sources : « What's cooking » World Bank report, Agfunder 2023 AgTech report

Current market valuation, segmentation and investment evolution

22,142.7 M$
Current market valuation (2022)

13.1%
Compound Annual Growth Rate (CAGR) 2022-2032

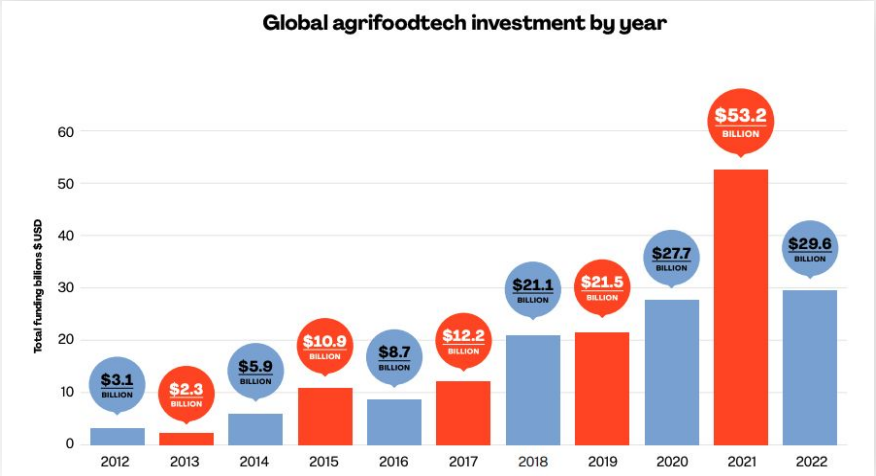
75,872.5 M$
Projected market value (2032)

Global investment in FoodTech and AgTech startups totaled 2,797 deals closing, reaching $29.6bn in 2022. It represents a 44% decline on record-breaking 2021 levels, largely in-line with global venture capital markets.

Climate technologies took center stage in the AgTech industry, with a strong focus on upstream innovations aimed at achieving a positive environmental impact.

In the Agtech sector, funding witnessed an increase in Ag Biotech, Bioenergy & Biomaterials, Farm Management Software & IoT, and Novel Farming Systems. On the other hand, funding experienced a decline of over 35% in meal delivery, eGrocery, alternative protein, cloud retail, and Midstream technologies.

AgTech Segment	Key Figure (2020 Valuation in USD billion)	Projected Growth (2026 Valuation in USD billion)	Brief Description
Precision Agriculture	4.33	11.88	Technologies providing real-time soil fertility, moisture measurements, and optimized planting
Livestock Monitoring and Management	2.88	7.98	Technologies providing insights into animal health and productivity
Indoor Farming	1.93	5.32	Focused on controlled-environment agriculture, includes advancements in hydroponics, aeroponics, and vertical farming
Aquaculture	1.14	3.11	Technologies for fish farming and seafood production, including water quality monitoring, feeding automation, and disease detection
Other Segments *(Agribusiness marketplaces, Sustainability-related technologies, Farm Robotics, Automation, and Electric Equipment)*	0.75	1.98	Comprises various AgTech applications not captured in the above categories



Sources : Agfunder “2023 AgTech report”, Statista, IMF, Spherical insights

Drivers and challenges associated with AgTech

Growth Drivers

Increasing investment: Influx of capital has fueled innovation, research, and development, leading to the growth of the market.

Technological advancements: Rapid advancements in technologies (AI, IoT, big data analytics, robotics…) have opened up new possibilities to optimize operations, improve efficiency, and make data-driven decisions, leading to increased productivity and profitability.

Global food security concerns: AgTech solutions offer the potential to increase agricultural productivity, optimize resource utilization, and reduce waste.

Sustainability and environmental concerns: Technologies help minimize the environmental impact of farming by reducing water usage, optimizing fertilizer and pesticide application, and promoting soil health but also support the development of alternative and renewable energy sources in agriculture.

Changing consumer preferences: AgTech solutions enable farmers to meet these preferences (transparency, traceability) by providing tools for precision farming, sustainable farming practices, and improved supply chain management. The COVID-19 pandemic has induced a shift in food consumption habits, with approximately 30% of consumers upping their intake of sustainable food products

Government support and policies: Governments and international organizations are recognizing the importance of digital transformation in agriculture and providing support through policies, funding, and infrastructure development.

Farmer openness to innovation: Farmers are becoming more open to adopting innovative technologies to overcome challenges and improve their operations. 39% of farmers globally are currently employing or plan to use at least one AgTech product in the next two years.

Challenges

Adoption Barriers: High costs, unclear ROI, and complexities in setup and use are major barriers that hinder the adoption of AgTech, especially among small-scale farmers.

Trust Issues: Particularly in emerging markets, there is a notable apprehension towards purchasing AgTech solutions through online platforms.

Interoperability and Standardization: The lack of standard data architecture and cross-platform interoperability can pose significant challenges.

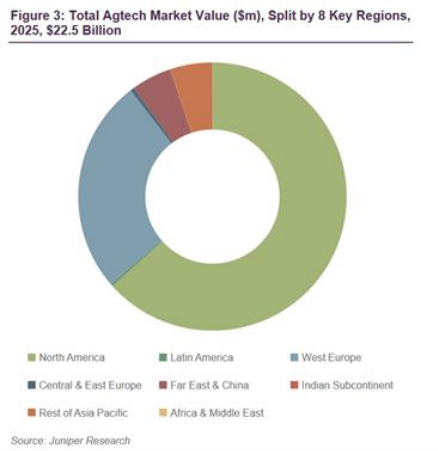
Regional Disparities: The level of AgTech adoption varies widely from region to region, indicating the need for tailored strategies to promote its benefits and mitigate barriers.

Regulatory Hurdles: AgTech often faces regulatory hurdles as governments struggle to keep up with the pace of technological change.

Market Volatility: The agricultural sector is inherently prone to uncertainties such as changing weather patterns, pests, and diseases, which can influence the success of AgTech solutions.

Sources : “From Agriculture to AgTech: Executive Summary” Deloitte Report 2016, Statista, Startup Genome AgTech report

AgTech regional specificities



MARKET VALUE PER REGION

According to a 2020 study from Juniper Research, the total value of the AgTech market is dominated by North America and especially the US with California. Western Europe and Asia also represent consequent shares of the industry while Latin America and Africa are still lagging behind.

In terms of adoption of AgTech, the rate varies significantly across regions, reflecting differing agricultural practices, resources, and attitudes towards technology : in Europe and North America, approximately 61% of farmers are using or planning to use at least one AgTech product within two years. Farmers in South America follow with a 50% adoption rate, but express apprehension towards online purchasing of AgTech solutions. AgTech product adoption is relatively low in Asia, standing at about 9%.

DEVELOPED COUNTRIES

In developed countries, AgTech is driven by advanced technological infrastructure, strong research and development capabilities, and a mature entrepreneurial ecosystem.

AgTech advancements include utilizing IoT, drones and satellite imaging for real-time data collection leading to optimized farming practices, automation and robotics, vertical or indoor farming, digital marketplaces, supply chain management systems connecting farmers directly to consumers and ensuring traceability and transparency.

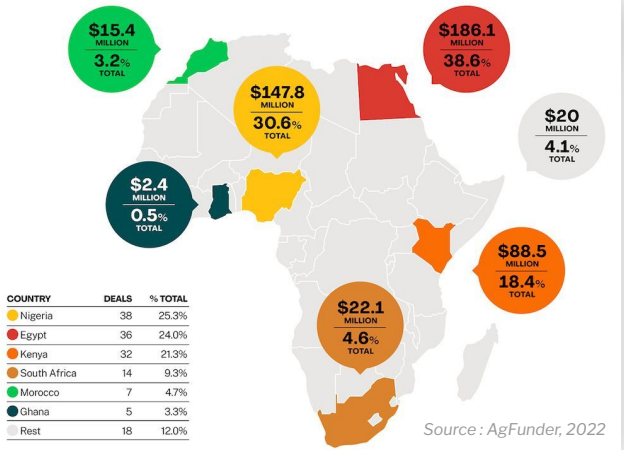
EMERGING COUNTRIES

In emerging markets, AgTech presents unique opportunities and challenges due to factors such as limited technological infrastructure, fragmented agricultural systems, and a large number of smallholder farmers.

AgTech advancements include utilizing mobile technology for data access, enabling farmers to stay informed about market prices, weather updates facilitating financial inclusion and microfinance, promoting e-commerce and digital market linkages, enhancing climate resilience through the implementation of climate-smart solutions.

Sources : Agtech: Market Outlook, Emerging Opportunities & Forecasts 2020-2025, Juniper Research, “AgTech: Breaking down the farmer adoption dilemma” McKinsey&Company, OECD

AgTech regional specificities: focus on the Middle East & Africa



COUNTRY	DEALS	% TOTAL
Nigeria	38	25.3%
Egypt	36	24.0%
Kenya	32	21.3%
South Africa	14	9.3%
Morocco	7	4.7%
Ghana	5	3.3%
Rest	18	12.0%

MARKET VALUE & TRENDS

The Middle East and Africa (MEA) region offers vast growth potential for AgTech. This diverse region presents unique market dynamics and challenges, creating opportunities for innovative AgTech solutions.

In Africa, more than 90% of the market for digital services supporting smallholder farmers remains unexploited, with an estimated value of $2.2 billion. African AgTech startups have secured $482.3 million in investment in 2021, with Nigeria, Egypt and Kenya emerging as key hubs. trends such as the increased adoption of mobile technology, the need for climate-smart agriculture, and the demand for efficient supply chain management are driving the growth of AgTech.

In the Middle East, the AgTech market is expected to grow at a compound annual growth rate of 12% by 2027. The region, characterised by water scarcity and a lack of arable land, has launched major investments in AgTech to secure future food supplies. Key trends in this region include the development of precision irrigation systems and the use of advanced sensor technologies for resource optimization.

Middle East & North Africa

The AgTech market size in is expected to grow with a CAGR of 12% in the MENA region by the end of 2027. Gulf countries especially have launched huge investments in the AgTech sector. The region is characterized by a lack of arable land and water scarcity issues (1% only of global water resources).,Therefore, AgTech solutions are increasingly implemented to promote future food supply. The region is relying a lot on imports, making it vulnerable to supply chain disruptions. The region's arid climate and scarce water resources have thus fostered the emergence of agricultural innovation hubs

Sub Saharan Africa

The potential for AgTech solutions in Sub Saharan Africa is driven by the existence of the largest area of arable uncultivated land in the world, the young population of the continent (60%) and increased mobile penetration. Countries in the area are at various phases of digital agricultural transformation, creating an opportunity for information, skills, and learning to be shared. Sub-Saharan Africa is in a unique position to more than double, if not triple, its present agricultural production. An improvement in agricultural output of this magnitude would help raise more than 400 million people in Sub-Saharan Africa out of severe poverty and enhance the livelihoods of around 250 million smallholder farmers and pastoralists in the area.

Sources : FAO, AgFunder, Venture Burn, OECD, World Bank

3. Gap analysis & Recommendations

3. Gap analysis & Recommendations

Methodology

Our 2-steps methodology

To develop AgTech startup ecosystems in emerging markets, it is necessary to **gather insights from multiple stakeholders** in the sector. We have thus developed **a methodology to select 10 case studies** in order to identify their best practices and challenges when creating their ecosystems.

1 FOUR POINT OF VIEWS WERE SELECTED TO COLLECT INFORMATION FROM ALL TYPES OF ACTORS :

INNOVATION PROGRAMS	STARTUPS	FINANCING ACTORS	PUBLIC AUTHORITIES
Understand how to **optimize the interactions** between innovation actors (public, private, entrepreneurs etc).	Understand **their needs and their challenges** and how to boost their development in this sector.	Understand their expectations and **ways to derisk investments** in AgTech / FoodTech in emerging markets.	Understand how they can help and **facilitate AgTech ecosystems development** in their regions.

Our 2-steps methodology

Based on these four types of actors, **a non exhaustive list of +100 potential case studies** was compiled. It was thus necessary to **prioritize the identified ecosystems** based on specific criterias.

2 TWO TYPES OF CRITERIAS WERE IDENTIFIED TO PRIORITIZE THE CASE STUDIES :

MANDATORY CRITERIAS

- The solution must be **replicable** in some way to emerging markets ;
- At least one case study per **geography** or region ;
- The case study must be recognized as **a reference** in the country ;
- Enough data on the case study and **resources** are accessible through our network and online research.

DIVERSIFICATION CRITERIAS

- The initiatives are launched from **various types of actors** (public, private, academic etc.) ;
- The case studies represent **different maturity levels** and sizes of ecosystems ;
- The case studies emerge from a variety of **developed and developing countries** ;
- There is a diversity of **funding strategy and regulation frameworks** within the case studies ;
- Some case studies can be **sector agnostic** instead of **AgTech focus** if it brings value to the research.

Selected case studies

At the end of this two-step process, **10 case studies** representing the different point of views and criterias pre-identified were selected to be studied for the purpose of this guidebook. A **series of interviews** were conducted as well as **desk research** to collect useful information (detailed reports are accessible in the appendix).

Plug & Play
Brazil

Private innovation platform backed by large corporates

AgriG8
Singapore

Startup

One Million Farmer Platform
Kenya

UN backed initiative

GASIP
Ghana

Government backed country-wide initiative

Food Tech Valley
Dubai, UAE

Government backed regional initiative

Station F
France

Private incubator backed by a solo founder

UM6P
Morocco

University based ecosystem (research, fund, incubator etc)

Cropin Technology
India

Startup

Proparco
France

DFI initiative in Africa

The Trendlines Group
Israël

VC fund specialised in AgTech / FoodTech

3. Gap analysis & Recommendations

Key Learnings

Gap analysis : identified challenges

From these 10 case studies, **6 challenges associated with AgTech ecosystems** were identified as they were common to multiple actors and depicting the current bottlenecks the agricultural value chain actors are facing.

 ACCESSING DATA	 FINDING FINANCING	 FITTING THE MARKET	 DEVELOPING A CULTURE	 CREATING AN ECOSYSTEM	 PUSHING NEW REGULATIONS
Difficult **access to reliable data** to : • qualify and size a market, startup valuation etc • optimize farmers' yields using weather predictions • ...	Lack of funding, **especially at early stages**, due to long development cycles compared to other sectors, complex solutions and small market sizes, making **investments riskier** Currency **devaluation** issues	Gap between innovation and **reality on the ground** : farmers need to clearly see the added value to invest in solutions because of their **low revenues**	Lack of **entrepreneurial mindset,** especially for researchers making **technology transfer** difficult between the actors involved **Governance** issues leading to failure of programs	**Lack of interactions** between the different players of the value chain, dealing with everyone's needs and **aligning incentives**	Need for **new regulations** to cope with the rise of new technologies but also to **attract foreign talent** as competition between programs is now cross-border. **Harmonization** among legal frameworks is needed to allow international cooperations.

Gap analysis : identified enablers

From these 10 case studies, several **enablers associated with AgTech ecosystems** were identified per type of actor :

ENABLERS FOR INNOVATION PROGRAMS

Enabler	Create an ecosystem that **involves all stakeholders** (academia, startups, corporates, public entities etc) and **covers all their needs.**	Launch free trainings on entrepreneurial mindset to **acculturate** the population (future leaders, partners, service providers etc).	**Differentiate programs** by thematics, to design clear vision and value propositions that answer a real need.	Partner with the public sector for **exchanging information and data** and not just focused on financial interactions.	**Outsource** tasks and services to expert suppliers with a clear governance to **facilitate operations** and day to day management.
Concrete example	trendlines Trendlines created a full ecosystem (tech transfer offices, industry partners, cooperatives of farmers, etc). to provide everything startups need to thrive.	PLUG AND PLAY BRAZIL Plug&Play acculturates large groups, for example by supporting them to set up pilot projects within their business units for effective integration of innovation.	GHANA AGRICULTURAL SECTOR INVESTMENT PROGRAMME Because the GASIP program has the objective of supporting women and young people, it targets specific parts of the value chain dominated by them.	STATION F Station F has very frequent exchanges with the French government and other public actors to share entrepreneurs' needs and current challenges.	Disruptive Agricultural Technology The One Million Farmers Platform acts as an interactions catalizer in the ecosystem and fosters partnerships among all players of the value chain.

Gap analysis : identified enablers

ENABLERS FOR INNOVATION PROGRAMS

ZOOM - Creating an ecosystem

The Food tech Valley provides an **all-in-one solution** for companies with the involvement of all stakeholders at **all parts of the value chain**:

- **Stakeholders**: farmers & producers, startups & SMEs, corporates, incubators & accelerators (partnership with the Greenhouse accelerator program of PepsiCo), governments & NGOs (partnership with the Free Zone Authority to provide services to companies), financial institutions & investors, academia & research centers (partnership with Emirates University connecting companies needed specific research so that academic researchers can work on the topic), international organizations, associations & councils, consultancy & advisory (to provide specific expertise).
- **Services provided**: physical space (lands available, agrihood concept, business park and market, residential and retail, warehouse, etc.), ecosystem program (incubation, acceleration, capacity building, community engagement, business development, etc.), and a one-stop shop services: sales & leasing services, licensing services, property & asset, ICT & security services, etc.

ZOOM - Acculturating

Because entrepreneurship is not an activity positively seen by the Moroccan population in general, UM6P launched several initiatives to acculturate the population and change the mindset towards entrepreneurship:

- **Entrepreneur Academy**: entrepreneurship training to develop an entrepreneurial mindset for students (as early as in high school), PhD students, researchers, and companies (especially for companies exploring entrepreneurship reorientation as an option in case of layoffs within the company).
- **AgriYoung Innovate**: challenge launched by the Ministry of Agriculture and the Agency for Agricultural Development, in partnership with UM6P and especially the P-Curiosity Lab. The goal is to reinforce the entrepreneurial ecosystem in rural areas and support young entrepreneurs in the digital agriculture and climate smart sectors. The 4 winners gained access to a coaching program within UM6P for several months as well as access to several services and facilities (expert advice, networking opportunities, training program, Fab Lab, experimental farm etc.).

Gap analysis : identified enablers

ENABLERS FOR INNOVATION PROGRAMS

ZOOM - Answering real needs

STATION F

Station F hosts a highly broad range of programs, each of them with its unique vision and value proposition. The goal is to offer innovative programs built and operated by the **best-in-class in each sector**:

- 1/3 of programs are provided by **corporates**, such as Media Lab TF1 (for innovative media solutions), Thales (for cybersecurity projects), Microsoft (for start-ups developing solutions to tackle environmental challenges and create a positive impact), etc.
- 1/3 of programs are provided by **academic players**, such as HEC (for alumni), CentraleSupélec (for projects building breakthrough innovations to meet the challenges of the 21st century), etc.
- 1/3 of programs are provided by **independent structures**, such as HECTAR (AgTech accelerator providing expertise, network, physical space and equipment), ShakeUp Factory (AgTech accelerator providing expertise and network), Schoolab - Pepite Starter (for students with the student-entrepreneur status), etc.

Each program has its own offer and way of functioning with startups : specific incubation program, support to launch a first proof of concept, etc.

ZOOM - Partnering for data exchange

MINISTRY OF FOOD AND AGRICULTURE (MOFA)
GHANA AGRICULTURAL SECTOR INVESTMENT PROGRAMME

The GASIP program interacts with many **national public players and NGOs** to provide services and data to farmers:

- The Centre for No-Till Agriculture (CNTA) provides **training** to farmers in climate resilience.
- Districts from the Ministry of Food and Agriculture provide local **technical support** to farmers.
- The Department of cooperatives from the Ministry helped to strengthen farmer-based organizations to form cooperatives and federations of cooperatives: this led to the f**ormalization of 500 farmer-based organization**s.
- The Ghana Irrigation Development Authority (GIDA) provides irrigation support to farmers operating within areas that had irrigation schemes and **help them make better decisions**.
- The Ghana Meteorological Agency provides **weather information.**
- The International Water Management Institute (IWMI) promotes **efficient water use** technology to the farmers.

Gap analysis : identified enablers

From these 10 case studies, several **enablers associated with AgTech ecosystems** were identified per type of actor :

ENABLERS FOR STARTUPS

Enabler	Pass through **local intermediaries** such as cooperatives, farmers' organizations or associations to gather data and beta-test solutions with lower acquisition costs.	Develop **regional solutions** (e.g. panafrican) and have **internationalization** in mind from the start to tackle larger markets and be financially attractive for investors.	Adapt to **market situation and evolutions** to develop innovations that are directly correlated to the actual needs on the ground.	Design a clear **IP strategy**, especially for researchers, to ensure **technology transfer** and **ownership** of the startup's assets.
Concrete example	Cropin Cropin has many partners along the value chain to gather data and bring more services to farmers at a lower cost. For example, Big Heart partners with Cropin to sell seeds to end customers on demand.	trendlines Trendlines supports startup internationalization from day 1 because the market is highly fragmented. This includes advice on go-to-market, finding partners, choosing an international name, etc.	AgriG8 AgriG8 realized that farmers were using their phones for non professional activities and therefore built a simple gamified user interface to reduce friction in usage and facilitate adoption.	trendlines Trendlines helps startups find a CEO and integrate him/her in the company when the researcher does not want to be an entrepreneur (gradually giving him/her equity for example).

Gap analysis : identified enablers

ENABLERS FOR STARTUPS

ZOOM - Leveraging local players

PLUG AND PLAY BRAZIL

Plug&Play Brazil strongly encourages startups to leverage contacts with **cooperatives** to reach farmers. The local team established that it was the best way to **get access to local producers**, for various reasons:

- The majority of commercial farmers is gathered in cooperatives, at least the ones with a critical mass to be commercially relevant
- The ecosystem is highly **fragmented**, going through cooperatives is a significant road to market

In addition, cooperatives and other farmers' associations are often **Key Opinion Leaders**, which makes them essential to **foster technological adoption** of new solutions for farmers. By being close to the final users (i.e. farmers), cooperatives are also highly relevant intermediaries to gather data on the real needs of farmers and promote new solutions' adoption.

ZOOM - Defining an IP strategy

MOHAMMED VI POLYTECHNIC UNIVERSITY

UM6P is frequently confronted with **IP-related challenges**, not only because of their partnerships with research centers, but also because many innovations emerge from PhD student's work.

The strategy to **protect these innovations** needs to be adapted to the situation but usually lies between these two cases :

- The researcher is technically strong but does not have an entrepreneurial mindset: in this case, UM6P will help in the **establishment of a joint venture between the researcher and a complementary team** to ensure the startup has the proper skill set to launch the innovation. This skill set usually includes business skills such as marketing and sales skills to actually bring the innovation to the market and create a real value proposition that answers a need.
- The **IP is purchased by another party** to develop the project:
  - it can be another team willing to create a startup with this IP
  - in the case of an IP that has been co-developed and co-patented between UM6P and the researcher, a licensing process can allow the exploitation of the IP.

Gap analysis : identified enablers

From these 10 case studies, several **enablers associated with AgTech ecosystems** were identified per type of actor :

ENABLERS FOR FINANCING ACTORS

Enabler	Create a continuum of complementary investment players and **various financing tools** to ensure investment at all stages such as bridge investments from DFIs, non-dilutive grants from the government, safe notes from accelerators etc.	Build a **strong network and knowledge** on the field to properly assess startups and help them get expert advice on their day to day challenges.	Build **partnerships between portfolio companies and corporates** before investment to accelerate development and lower the risk of the investment.
Concrete example	PROPARCO GROUPE AFD Proparco ensures startups find financing at all stages of development by partnering with other players (AFD for early-stages), financing Series A and B in co-investment with other funds such as Partech or other DFIs, and providing Bridge funding if needed (investment between 2 rounds).	trendlines Trendlines Group strongly believes that partnerships are crucial to develop a project, especially in sectors such as AgTech, which requires specific knowledge. The fund has partnerships all over the world with various stakeholders of the ecosystem.	MOHAMMED VI POLYTECHNIC UNIVERSITY Startups that want to receive an investment from UM6P Ventures usually work with the OCP Group to experiment and prove their model through the different innovation programs. The organization also fosters collaborations between startups and local players external to the group.

Gap analysis : identified enablers

ENABLERS FOR FINANCING ACTORS

ZOOM - Building network & expertise

Trendlines built its **expertise** on the conviction that the specificities and risks of the AgTech sector could not be properly understood by generalist VC funds, leading to risk misperceptions and low-quality support provided to startups.

In addition, Trendlines acknowledges that the sector is extremely broad and that each tiny part of the value chain of a subsector presents its own challenges. For this reason, the VC fund built a strong ecosystem of partners all around the world, in order to be able to provide best-in-class expertise and services to the projects they invest in. They also foster collaboration with cooperatives of farmers as they can be early adopters, Key Opinion Leaders, and allocate land to test an innovative solution.

Finally, to stay up-to-date with the **latest trends**, meet partners, and properly supports startups, Trendlines Group organizes and participates in global conferences on AgTech.

AgriG8, a company Trendlines invested in, considered extremely valuable the expertise brought by Trendlines on the various thematics of their project.

ZOOM - Building partnerships

Plug & Play **facilitates collaboration** between startups and corporations. These collaborations allow corporations to explore different verticals, discover new geographies, and expand worldwide across various areas of knowledge.

It also goes through the **connection of corporations with startups**, which have the possibility to launch proof of concept and/or develop their activity thanks to this partnership. Plug & Play has successfully connected over 550 corporates to more than 150,000 startups, with an annual acceleration of 240 startups and 200 investments.

Plug & Play also ensures the existence of a real *fit* between the corporation and the startups, evaluated on various criteria, such as the **relevance of the solution** provided by the startup compared to the needs of the corporation, and the **ability of the startup to interact** with a bigger player and benefit from this cooperation.

These collaborations may happen in the context of simple partnerships or **open innovation initiatives**. Corporates might then decide to pursue the partnership, adjust it, put an end to it, or even invest in / buy the startup.

Gap analysis : identified enablers

From these 10 case studies, several **enablers associated with AgTech ecosystems** were identified per type of actor :

ENABLERS FOR PUBLIC AUTHORITIES

Enabler	Create **new regulations** in accordance with emerging trends and market needs.	**Facilitate administrative procedures** related with the creation and operation of a local company or the implementation of a foreign one.	Mobilize and assign **consequent public budgets** to innovation in the Ag/Food sector.	**Implicate commercial banks** in public programs with a part of the budget to **incentivize them** into financing actors from the agricultural sector.
Concrete example	Cropin The Indian government is proactive in creating critical support programs for farmers such as crop insurance programs. It also created regulations on data privacy that Cropin leverages for its business.	foodtech valley The FoodTech Valley provides an all-in-one solution for companies wanting to operate in Dubai, including facilitated administrative procedures thanks to a partnership with the Free Zone Authority.	trendlines Through their experience in various countries and especially in Singapore, Trendlines witnessed the role of public support. Public grants for startups are critical to close the early financing gap.	GASIP – Ministry of Food and Agriculture (MOFA) – Ghana Agricultural Sector Investment Programme The implementation team of the GASIP program tried to involve commercial banks but they learned that banks had to be incentivized to lend to farmers, to compensate for the high risk of the sector.

Gap analysis : identified enablers

ENABLERS FOR PUBLIC AUTHORITIES

ZOOM - Mobilizing public budget to support disruptive innovation

AgriG8

AgriG8 benefited from Singapore's legal framework on innovation and its associated public support. The country has developed tools and mechanisms to financially support innovation in various sectors. The Monetary Authority of Singapore (MAS) created a Smart Financial Centre to support FinTech innovations, especially cross-cultural ones that have a positive impact on other sectors such as AgTech and FoodTech. It promotes 6 main activities:

- **Hire Talent** initiatives include:
  - Funding of 80% of the salaries of researchers, scientists and engineers identified, hired, and trained by partners (deep tech accelerators, corporate innovation houses, incubators, venture builders and VC firms) in both the technical and business development aspects of deep tech.
- **Get Investments** initiatives include:
  - Co-investing with investors into startups and investing in venture capital firms that will then invest into startups, through a fund-of-funds approach. Co-investments ratio amount to $7 for every $3 raised by the entrepreneur for the first $250K and $1 for every $1 raised thereafter.
- **Adopt Digital Solutions** initiatives include:
  - Regulatory Technology Grant for startups enhancing financial institutions' risk management and regulatory compliance thanks to digital solutions.
- **Get Business Development Support** initiatives include:
  - Up to 70% funding support for adopting IT solution and equipment.
- **Adopt AI / Data Analytics Technology** initiatives include:
  - Up to 50% support for projects demonstrating adoption of AI & DA techniques (for expenses linked to direct manpower and project-related costs).
- **Do Proof-of-Concepts** initiatives include:
  - Up to $400K to conduct early stage development of innovative solutions.

3. Gap analysis & Recommendations

Practical tool for assessing an ecosystem's maturity level

Practical tool for assessing an ecosystem's maturity level

The **maturity assessment matrix is based on 6 dimensions** that are weighted according to their importance and that each have 4 pre-defined criterias that permit to assess different aspects of the studied ecosystem. A grid on how to calculate the score is detailed in the following pages.

The rating of all the criteria is weighted to generate a final score that can determine the maturity level of the ecosystem

/10

Country level

- ❑ The agricultural sector plays an important role
- ❑ Export is a key economic driver
- ❑ The government has launched initiatives and assigned public budget to solve agricultural challenges
- ❑ The legal framework is favorable to innovation in AgTech

Value Proposition

- ❑ The vision is aligned with the political ambitions
- ❑ The offer is focused on AgTech / FoodTech
- ❑ Product-Market fit has been reached
- ❑ Competitors are identified

Market

- ❑ The market size is large enough
- ❑ Reliable data is accessible
- ❑ There is a clear access to customers and farmers
- ❑ International expansion is part of the growth strategy

Finance

- ❑ A clear business model has been tested and is viable
- ❑ Private & Public investors have been identified
- ❑ Development Finance Institutions (DFIs) are interested
- ❑ The ecosystem (program, initiative etc) is investment ready

Partnerships

- ❑ Stakeholders from the value chain are involved
- ❑ Partnerships have been implemented
- ❑ Governance is clearly defined and is not a barrier
- ❑ External services have been identified

Talent

- ❑ There are entrepreneurs willing to address AgTech
- ❑ The team is acculturated to innovation and entrepreneurship
- ❑ Talent is easily accessible for potential recruitment
- ❑ Expert mentors and advisors have been identified

Practical tool for assessing an ecosystem's maturity level

	Assessment criteria	Scoring grid	Weight
COUNTRY LEVEL	The agricultural sector plays an important role in the country	It is not an important driver in the country (0) It plays a role that is not negligible (0,5) It is a crucial driver of the country (1)	2
	The government has launched initiatives and assigned public budget to solve agricultural challenges	Not at all or only a few initiatives (0) Yes, it is a priority for the government (1)	
	The legal framework is favorable to innovation in AgTech	Many legal challenges exist (0) Some efforts have been made (0,5) The regulation facilitates innovation (1)	
	Export is a key economic driver	No, the country does not do many export (0) Yes, the country is open internationally (1)	
MARKET	The market size is large enough	The market represents < 1 bn $ (0) The market represents > 1 bn $ (1)	2
	Reliable data is accessible	Data is a clearly identified issue (0) Reliable data can be accessed (1)	
	There is a clear access to customers and farmers	They are hardly accessible (0) They are reachable directly or through intermediaries (1)	
	International expansion is part of the growth strategy	International expansion has not been considered (0) Regional expansion is of interest (0,5) International expansion is of interest (1)	

Practical tool for assessing an ecosystem's maturity level

	Assessment criteria	Scoring grid	Weight
PARTNERSHIPS	Stakeholders from the value chain are involved	No stakeholder is involved (0) Some stakeholders are involved (0,5) All stakeholders are involved (1)	1
	Partnerships have been implemented	No partnership in place (0) Some partnerships are validated / signed (1)	
	Governance is clearly defined and is not a barrier	No governance strategy in place (0) Governance is defined but challenging (0,5) Governance is not a barrier (1)	
	External services have been identified	Service providers have not been identified (0) Competent outsourcing is identified (1)	
VALUE PROPOSITION	The vision is aligned with the political ambitions	Vision is not clearly defined (0) Vision is defined and aligned with the political one (1)	1
	The offer is focused on AgTech / FoodTech	The offer is large and concerns multiple sectors (0) The offer is well established and focused on AgTech (1)	
	Product-Market fit has been reached	The market has not validated the offer yet (0) A clearly defined market has validated the offer (1)	
	Competitors are identified	Competition does not exist or has not been identified 0) Competition has been identified and is not considered as a threat (1)	

Practical tool for assessing an ecosystem's maturity level

	Assessment criteria	Scoring grid	Weight
FINANCE	A clear business model has been tested and is viable	No viable business model has been identified yet (0) A business model is identified but not profitable (0,5) The business is running and profitable (1)	2
	Private & Public investors have been identified	No financing strategy is identified (0) Financing from the private/public sector is identified (1)	
	Development Finance Institutions (DFIs) are interested	No DFIs have been contacted or are interested (0) Some discussions with DFIs are ongoing (0,5) DFIs have showed interest in investing (1)	
	The ecosystem (program, initiative etc) is investment ready	The ecosystem still needs time to be operational (0) The ecosystem is ready to receive investments (1)	
TALENT	There are entrepreneurs willing to address AgTech	There are no entrepreneurs on this field (0) Entrepreneurs are interested to launch Ag startups (1)	1
	The team is acculturated to innovation and entrepreneurship	The core team needs acculturation (0) The core team is innovation-friendly (1)	
	Talent is easily accessible for potential recruitment	Finding talent is an issue in the country (0) Talent pool have been identified (1)	
	Expert mentors and advisors have been identified	No expert has been identified or contacted (0) Some experts have been reached but not locally (0,5) An experts pool locally and abroad is available (1)	

Practical tool for assessing an ecosystem's maturity level

Below is a table to help **calculate the level of maturity** of an ecosystem using the list of questions provided before :

	Weight		Score		Total / dimension		Total		Global score
			0-4 per line				*/36*		*/10*
COUNTRY LEVEL	2	X		=					
MARKET	1	X		=					
PARTNERSHIPS	2	X		=		=		*x 10 then ÷ 36*	
VALUE PROPOSITION	1	X		=					
FINANCE	2	X		=					
TALENT	1	X		=					

3. Gap analysis & Recommendations

Roadmap for the development of start-up ecosystems

Roadmap for the development of start-up ecosystems

Once a score is obtained from the maturity assessment matrix, **specific actions should be taken based on the level of maturity** of your ecosystem :

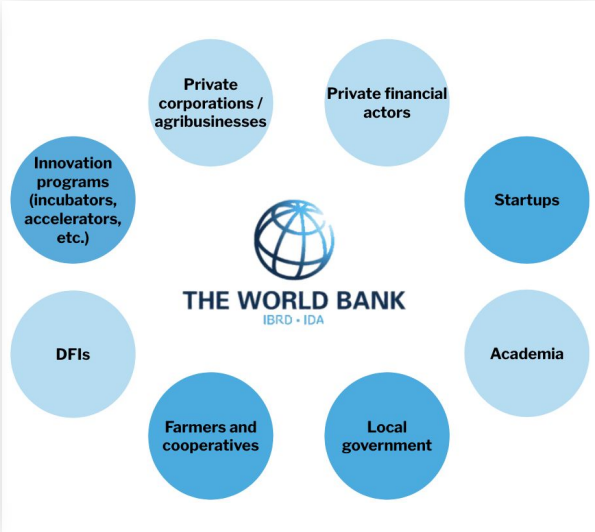
	Nascent *Maturity level : 0-3 / 10*	**Intermediate** *Maturity level : 3-7 / 10*	**Advanced** *Maturity level : 7-10 / 10*
Collaborations to develop & players to involve in the startup ecosystem	For nascent ecosystems, the main objective should be to **access farmers through organizations** such as cooperatives to provide them with the necessary tools and skills to **enhance productivity** and have a **social impact**. Collaborating with the government is also key to create **tripartite partnerships :** "public-private-farmers" and hence **acculturate** actors across the value chain.	When some **local startups** are present, it is important to help them go through **early stage** by launching **incubators** focused on : • **Training and coaching** of the entrepreneur (soft and hard skills) ; • Access to toolkit and processes to find **product-market fit ;** • Developing POCs through **corporate partnerships ;** • Collaboration with nearby startups to create **regional ecosystems.**	A mature ecosystem should aim to **consolidate an all-in-one offer** dedicated to all actors from the value chain, in one **physical space**. The goal is to build **acceleration programs** and financing mechanisms destined to make startups **go to scale**. **Communication** through events and creation of data hubs is key to **attract international startups**.
Financing solutions to leverage	**Grants from the government** and **support from DFIs** is the sole financing solution for ecosystems that are just getting started and that focus on **impact on the ground.**	**Public financing** is still key but **local private actors** should also start investing as it can benefit the ecosystem but also their own business (e.g. a new market opportunity through a startup's collaboration).	As the ecosystem becomes globally attractive, **international private actors** and **business angels** can complement local public and private investment to gain access to high potential startups.
Development of AgTech solutions	Focus on the development of **traditional solutions benefiting smallholder farmers** (e.g. farmers' trainings on best practices, inputs marketplaces…)	Focus on the development of **a mix of traditional solutions and more innovative ones** such as smart irrigation systems or drones for crops monitoring.	Focus on the development of **disruptive AgTech and FoodTech** solutions such as alternative proteins or algae fertilizers.

Evolution of the involvement of actors according to the ecosystem's maturity level

As the level of maturity of the ecosystem evolves, the **variety of actors involved** evolves as well to create **a complete and effective ecosystem**.

Nascent
Maturity level : 0-3 / 10

Intermediate
Maturity level : 3-7 / 10



Advanced
Maturity level : 7-10 / 10

Very high — Very low

Level of involvement of the player in the ecosystem

Zoom on the enablers for local public authorities depending on the maturity level

Nascent
Maturity level : 0-3 / 10

INNOVATION PROGRAMS

- Grants and loans, especially for tech early-stage incubators, as well as for programs involving all players of the ecosystem and aiming at fulfilling all farmers and entrepreneurs' needs: financing and provision of inputs and equipment, partnerships facilitation with other players to improve market access, etc.
- Insights on needs and challenges of startups and programs through surveys or quarterly meetings with public authorities
- Meetings facilitation with cooperatives and other players of the ecosystem to share insights on on-the-ground needs and challenges and explore possible synergies

STARTUPS

- Simple business rules to create and close a business, hire people, get a loan, protect IP, etc.
- Grants and loans, with a specific focus on early-stage projects
- Insights on needs and challenges (for example about regulation) through surveys, addressed directly or through innovation programs
- Facilitated administrative services to operate

Local government

INTERNATIONAL ORGANIZATIONS (DFIS, NGOS, ETC.)

- Local and international trends and insights on innovation, regulation, etc.
- Grants and loans to launch traditional agriculture projects including various stakeholders of the ecosystem such as cooperatives and an increasing focus on innovative solutions to facilitate day-to-day operations of farmers, such as inputs marketplaces

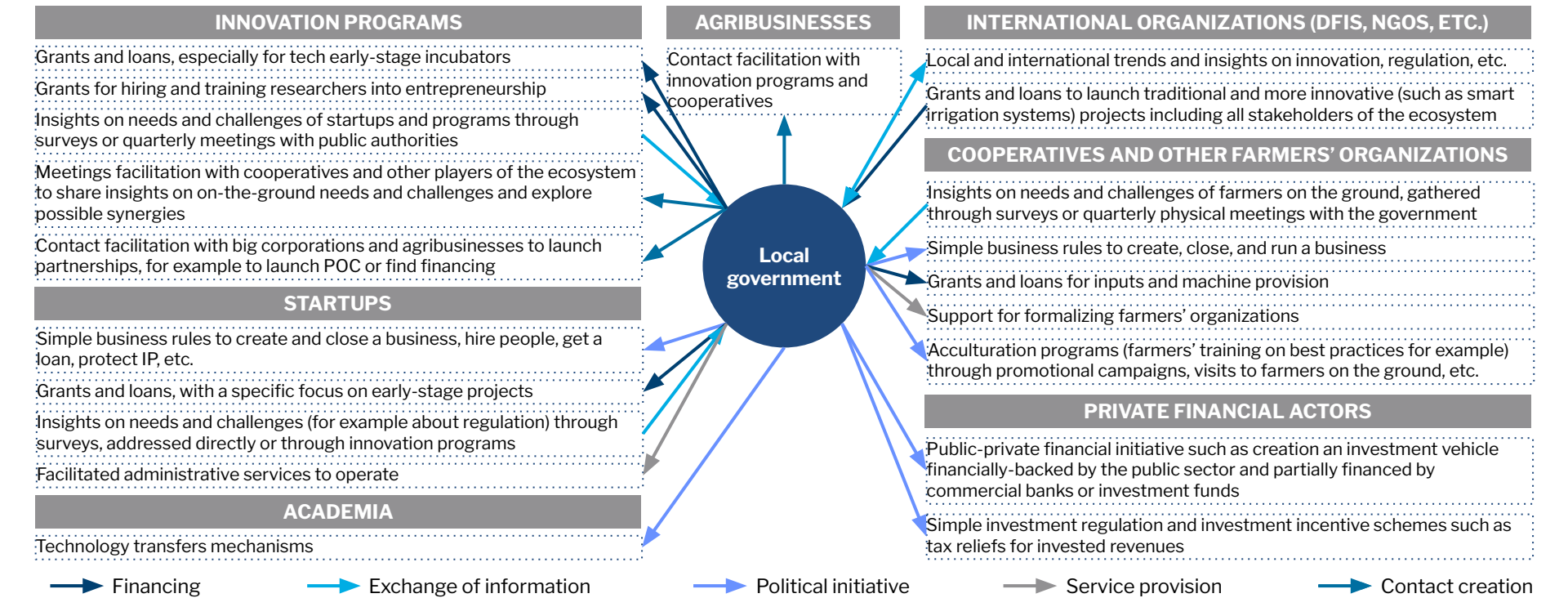
COOPERATIVES AND OTHER FARMERS' ORGANIZATIONS

- Insights on needs and challenges of farmers on the ground, gathered through surveys or quarterly physical meetings with the government
- Simple business rules to create, close, and run a business
- Grants and loans for inputs and machine provision
- Support for formalizing farmers' organizations
- Acculturation programs (farmers' training on best practices for example) through promotional campaigns, visits to farmers on the ground, etc.

Financing | Exchange of information | Political initiative | Service provision | Contact creation

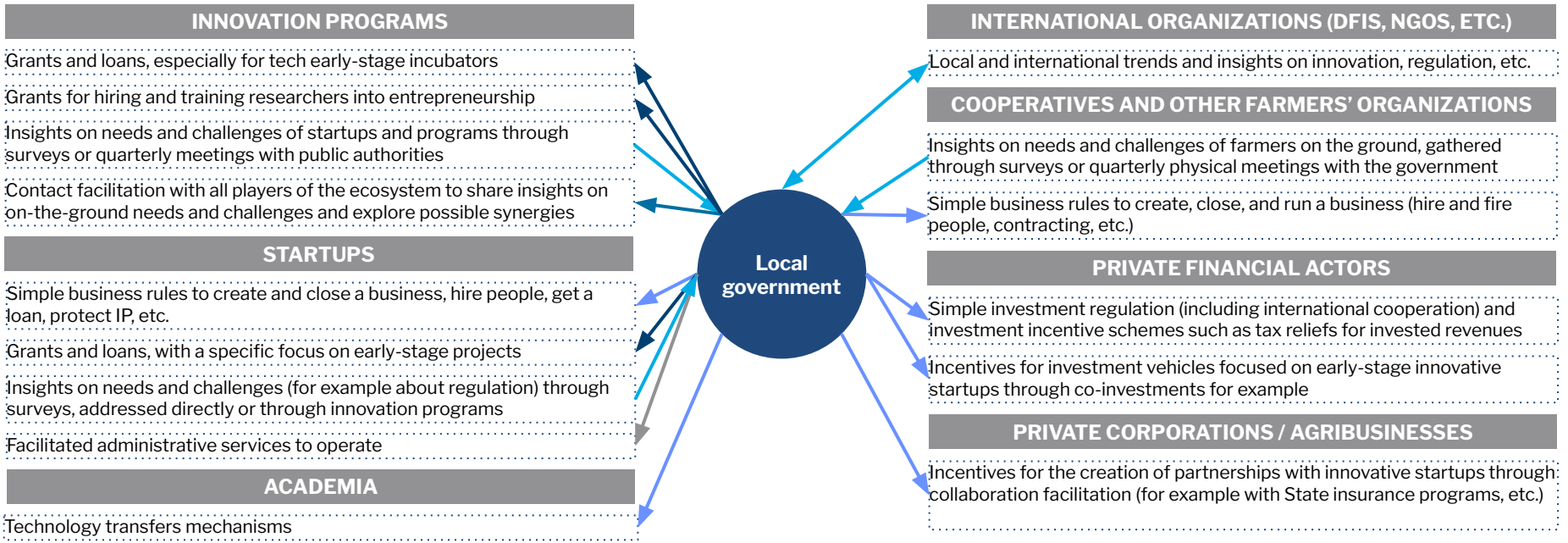
Zoom on the enablers for local public authorities depending on the maturity level

Intermediate
Maturity level : 3-7 / 10



Zoom on the enablers for local public authorities depending on the maturity level

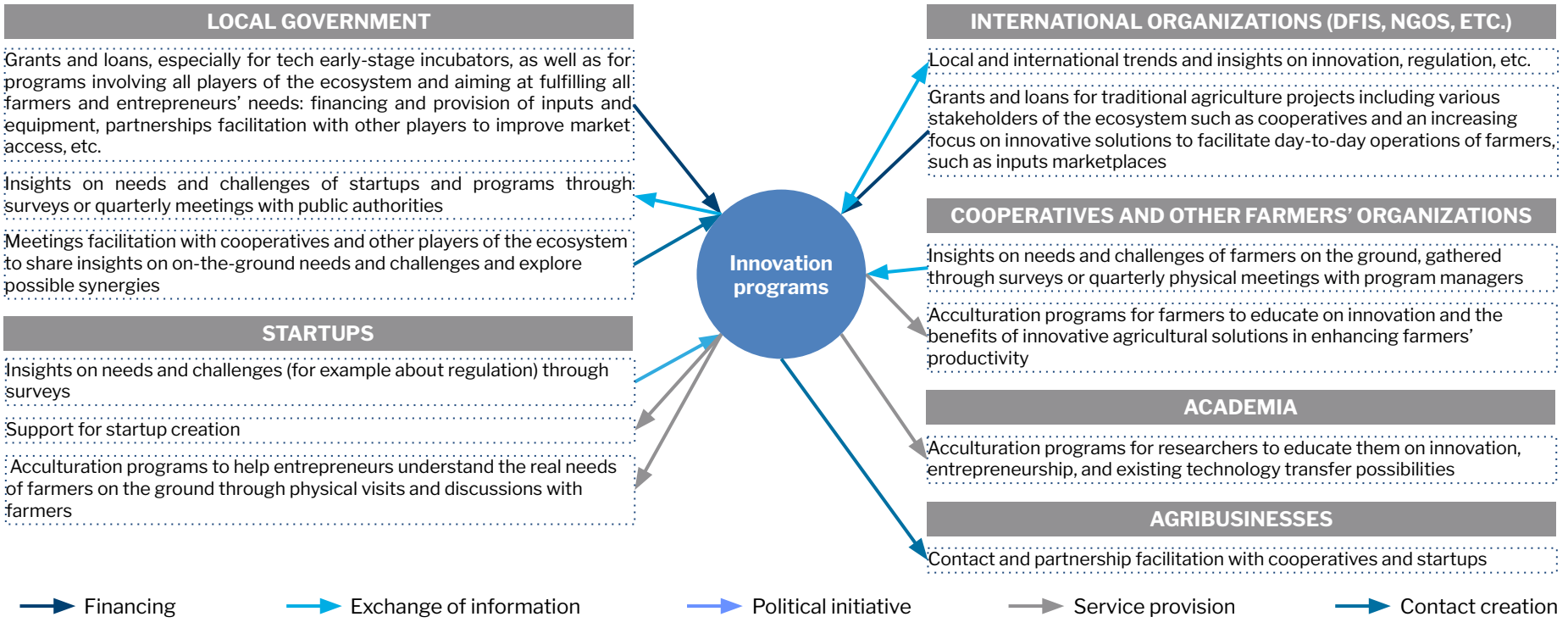
Advanced
Maturity level : 7-10 / 10



Financing | Exchange of information | Political initiative | Service provision | Contact creation

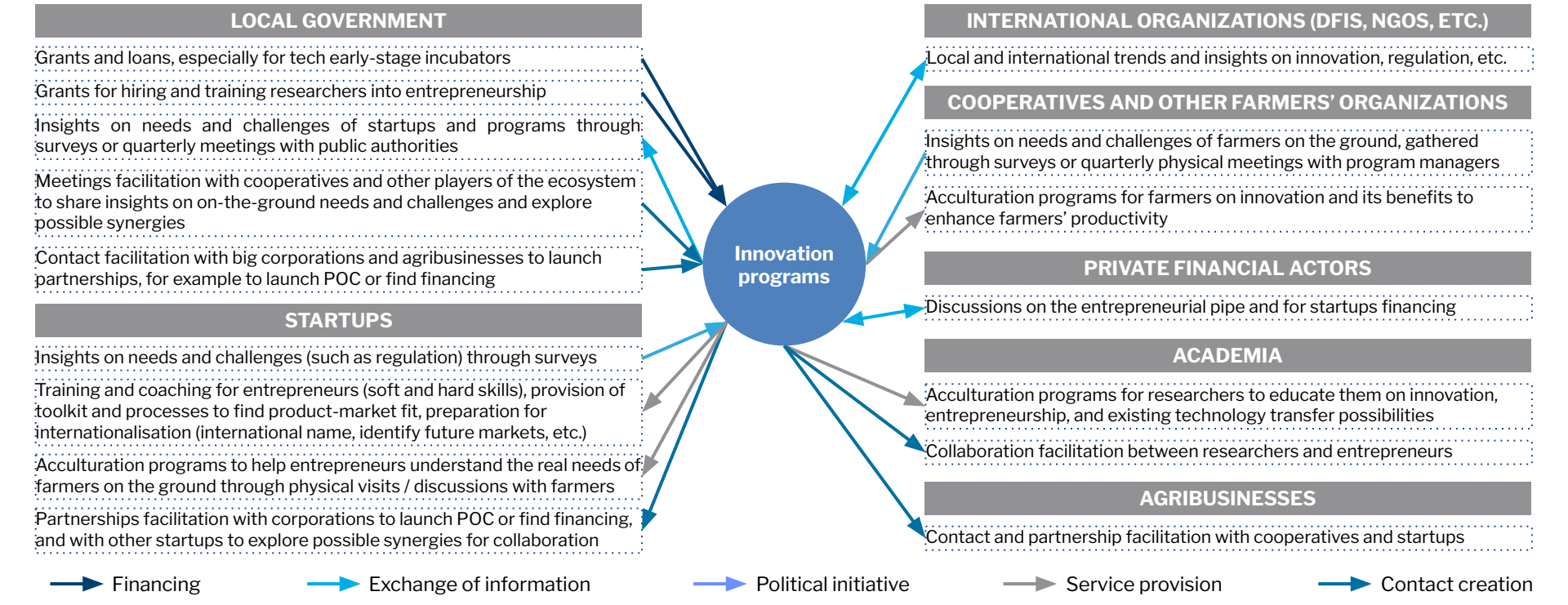
Zoom on the enablers for innovation programs depending on the maturity level

Nascent
Maturity level : 0-3 / 10



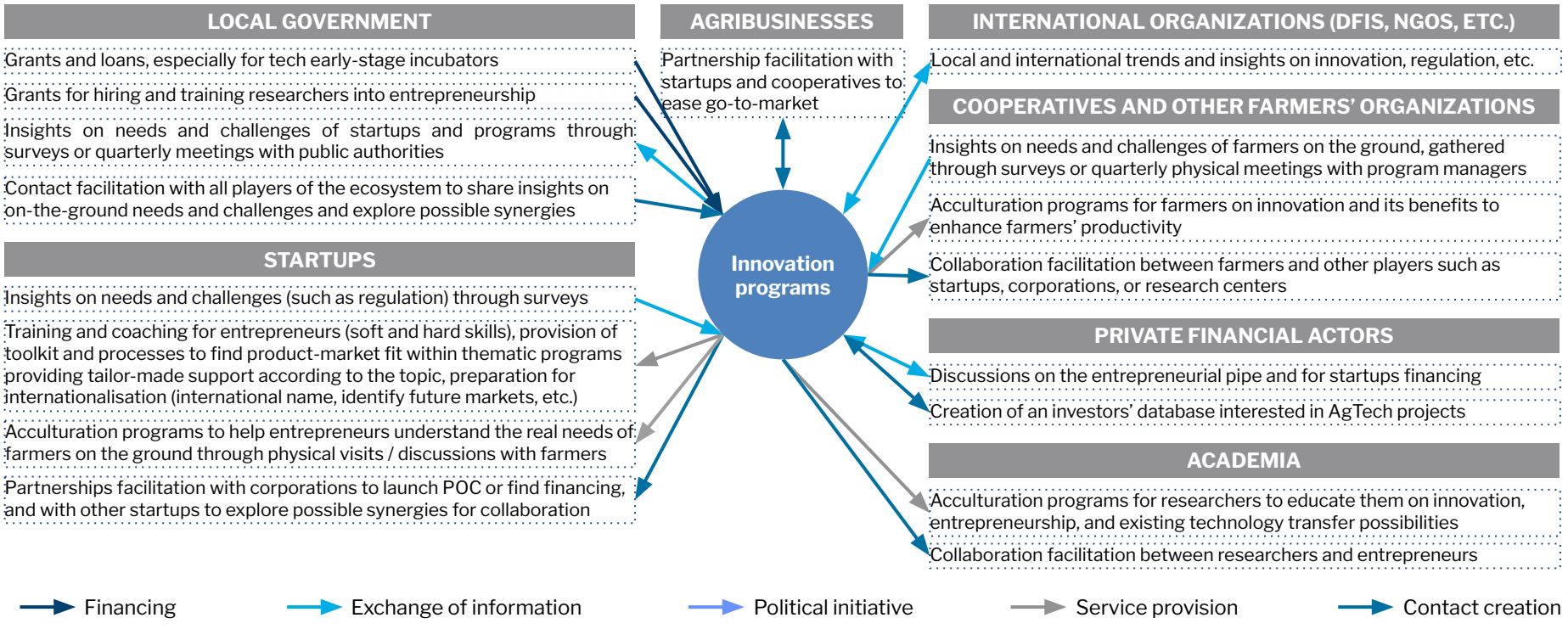
Zoom on the enablers for innovation programs depending on the maturity level

Intermediate
Maturity level : 3-7 / 10



Zoom on the enablers for innovation programs depending on the maturity level

Advanced
Maturity level : 7-10 / 10



4. Conclusion

Main outcomes of the guidebook

The development of the AgTech sector is of increasing importance due to **raising challenges of food security and climate change** all around the world. Smallholder farmers represent a significant part of the global economy, and their activity is crucial in facing these urging challenges. Simultaneously, the increased use of ICTs and other technologies by farmers bring **new opportunities** to solve these problems in more disruptive ways.

This guidebook is based on **10 case studies** involving **different types of actors**, selected for their complementarity and usefulness to understand how AgTech ecosystems work and what their needs are. Insights and knowledge extracted from these discussions allows to identify **best practices and tools** to develop efficient ecosystems in all parts of the world.

Six main challenges were identified as being common to multiple actors and depicting the current bottlenecks in the agricultural value chain: (1) **access to data**, including the challenges linked to collecting it, gathering it and extracting data intelligence to leverage it; (2) **finding financing** at all stages of development of a project, and especially at the very beginning when the project is highly risky; (3) **fitting a market** and developing innovations that have a high impact potential for farmers and that are adapted to their needs and challenges; (4) **developing a culture** of innovation to foster entrepreneurship and facilitate collaborations between entrepreneurs and other players such as corporates or public actors ; (5) **creating an ecosystem** by leveraging each players' expertise and aligning incentives to foster cooperation ; (6) **pushing new laws** to adapt to innovation and harmonize regulations to avoid regulatory frictions and facilitate collaboration.

Enablers have been identified for each of these challenges, such as the use of **new financing tools** to bridge financing gaps faced by startups, the **allocation of grants** by the public sector to promote innovation in targeted segments and/or part of the value chain and **support early-stage disruptive innovation**, the **implication of cooperatives** of farmers to leverage their network and influence to facilitate go-to-market and get insights on the real needs of farmers, **collaborations between startups and corporations** to facilitate access to market and support corporate innovation, etc. Overall, **collaboration and data exchange** have shown to be key elements for the sector's development and the improvement of farmers' situation.

The practical tool to assess ecosystems' maturity level and the associated roadmap are designed as fundamental tools to leverage these enablers and **implement concrete and targeted initiatives** at all levels that will allow the ecosystem to reach a higher level of maturity and, in a **virtuous circle mechanism**, foster new innovative initiatives that will in turn have an impact more globally on the populations.

5. Appendix

Detailed case studies : 10 ecosystems classified by their maturity level

Nascent → Intermediate → Advanced

1 NASCENT

- *One Million Farmers Platform : a United Nations backed initiative*
- *Ghana Agricultural Sector Investment : a government backed country-wide initiative*

2 INTERMEDIATE

- *Mohammed VI Polytechnic University : a University based ecosystem*
- *Proparco : a DFI initiative in Africa*
- *AgriG8 : an AgTech startup*

3 ADVANCED

- *Trendlines Group : a VC fund specialised in AgTech / FoodTech*
- *Station F : a private incubator backed by a solo founder*
- *Food Tech Valley Dubai : a government backed regional initiative*
- *Cropin Technology : an AgTech startup*
- *Plug & Play Tech Center : a private innovation platform backed by large corporates*

One Million Farmers Platform

Case study : a United Nations backed initiative

Source : kenyaomf website

One Million Farmers Platform

Case study : a United Nations backed initiative

Kenya

An initiative from The World Bank aiming to **help smallholder farmers** by offering a host of benefits and access to affordable services that address major pain-points in their operation. By adopting the host of innovations on the platform, they will be able to increase their yields, receive financial services, access local and international markets, and more. Ultimately, through optimizing their operations through innovations, smallholder farmers increase their incomes and reduce poverty

Country-level context :

The **agricultural sector is a pillar of the Kenyan economy,** contributing to 24% of GDP and involving almost 70% of the active population. Kenya is leading the agricultural technology space, with 30% of DATs (Disruptive Agricultural Technologies) located in Kenya. Kenya is also rated as one of the top-rated digital ecosystems on the continent.

The **startup ecosystem** in Kenya is very vibrant : many startups get launched but many fail as well due to multiple factors : connectivity challenges, wrong business model, farmers' literacy, lack of funding etc.

There are **multiple VC funds investing in early stage** startups but very few are focusing on agriculture because they prefer investing in **EdTech, HealthTech and FinTech** that have shorter cycles of testing and thus faster ROI.

In order to develop the agricultural sector, **two large public initiatives** were launched in Kenya :

- National Agricultural and rural Inclusive Growth Project
- Kenya Climate Smart Agriculture Project where around 1 000 000 smallholder farmers across the 45 rural counties in Kenya are involved

Genesis of the initiative :

In the context of the 2 projects launched in Kenya, they organized **smallholder farmers into organizations** and decided to **make investments across the value chain** with a focus on service delivery in the last mile and public-private partnerships.

The Bank team held a **Challenge Conference in April 2019** in cooperation with the Ministry of Agriculture, Livestock, Fisheries and Irrigation (MoALFI) and the Korea-World Bank Partnership Facility. The objective of the conference was to identify a set of Agriculture Tech Startups that could partner with the National and County Governments, leverage the analog investments being made under the KCSAP and NARIGP project and scale up the access to digital agriculture technologies for farmers in Kenya.

The conference culminated in the l**aunch of the One Million Farmer Initiative**, a digital platform to build Kenya's DAT ecosystem further and identification of 14 Ag-tech startups across four areas namely – Productivity, Financial Services, Market Linkages and Data Analytics.

One Million Farmers Platform

Case study : a United Nations backed initiative

Kenya

Ecosystem interactions :

The One Million Farmers Platform is **functioning as an accelerator**, it brings players of the ecosystem together and **facilitates their interaction** without having direct partnerships between The World Bank and other actors apart from the **local government**. The World Bank acts as a coordinator.

Startups are selected to join the program and are then **partnering** with various actors through **MoUs** (memorandum of understanding) to benefit from their expertise.

Startups include companies such as :

- Apollo Agriculture : unlocking the potential of small-scale farmers with best-in-class inputs, financing, insurance, and training
- DigiCow : a mobile-based service delivery platform enabling vet service providers to digitize their work with farmers, allowing for data-driven decisions
- HelloTractor : provides technology IoT hardware and software for tractor owners to better manage their equipment, fuel, and operators while servicing smallholder farmers in need of mechanization services resulting in an increase in crop productivity.
- EzyAgric : one stop shop for all the Agricultural Inputs and Services
- ...

Partnerships may involve NGOs, such as the Bill & Melinda Gates Foundation that is providing complementary technical support and additional funding or **Mercy Corps AgriFin** and **Microsoft** that are coaching with the entrepreneurs and preparing them for market and scale up.

There are also partnerships with private companies or other institutions such as the European Union or Ministers from other countries to **exchange knowledge**.

Actors involved :

Initiative led by :

WORLD BANK GROUP

Korea Green Growth Trust Fund

Ministry of Agriculture & Livestock Development

NGO Partners :

MERCY CORPS AGRIFIN

BILL & MELINDA GATES foundation

Rabobank Foundation

Microsoft

AGRA Growing Africa's Agriculture

Startups :

DigiCow Dairy App

hello tractor

Apollo Agriculture

EzyAgric "Endless farming possibilities"

SunCulture

Non exhaustive list

One Million Farmers Platform

Case study : a United Nations backed initiative

Kenya

Operations :

The One Million Farmers Platform functions as cohorts. There are currently **35 startups split between 4 tracks** : Productivity, Market linkages, Financial inclusion and Data analytics.

The objective of the platform is to **make startups scale x10** (e.g. going from a 5K customer base to 50K) **through various partnerships** that are facilitated by the World Bank teams.

The core role of OMFP is to **aggregate farmers into common interest groups** of 15 to 20 farmers and then grouping these in cooperatives of larger areas that can benefit from the so-called partnerships. They are currently on a pilot phase in Kenya with 26 county governments.

Sourcing of startups :

To source startups for the platform, a specific **assessment criteria list** and process has been created. For instance, startups need to have at least 3-4 years and proven scalability as well as using disruptive technologies.

A **hackathon** was organized by the World Bank to call for applications and assess the participants through this criteria list, a bootcamp session, some coaching and a final pitching session in front of an expert jury.

Every year, **new startups** are evaluated to increase the platform's impact and replace companies that have left the cohorts due to financial issues or other problems.

Perspectives :

The One Million Farmers Platform's vision is to reach 1 million farmers and **expand the project in nearby countries** such as Uganda, Somalia, Rwanda etc.

They hope to see **more initiatives and investments from the government** as there are currently no grants even though the politics are fully supporting digital agriculture.

One Million Farmers Platform

Case study : a United Nations backed initiative

Kenya

Financing :

The OMFP was created as an **impact-driven project** and hence has no interest in financial ROI. No equity or fee is asked from the startups and no business model is in place.

Main expenses involved for this initiative include :

- Farmer mobilization
- Light equipment
- Capacity building
- Project management (no real estate as the startups have their own offices)

On the first year, the project gave direct financing to startups but this model was not sustainable so for the subsequent years, they financed the government so that it is able to finance the startups himself.

Investment :

Financing comes from The World Bank through **a loan dedicated to the NAVCDP project** and where the One Million Farmers Platform is a subcomponent.

The loan is **assigned to the local government** for specific objectives defined in the project and then the government is in charge of dedicating this budget on the operational side :

- Farmers' training
- Light equipment (no capital investment)
- Farmers mobilization and acquisition
- ...

WORLD BANK GROUP

Success story : SunCulture

SunCulture is a startup that uses off-grid solar technology to provide farmers with reliable access to water, irrigation, lighting, and mobile charging within a single system. They also offer a Pay-As-You-Grow option that allows farmers to pay in small monthly installments.

Within the platform, SunCulture is part of the Productivity track of the cohort and has set up demo farms in six counties in Kenya. They offer solar-powered irrigation equipment. The farmers learn how to run and maintain the irrigation equipment from the demo farms making it easier for them to implement the same on their farms. With the use of pumps, oxen are no longer required to carry water and as such have become more productive.

One Million Farmers Platform

Case study : a United Nations backed initiative

Kenya

Best practices :

- Clear **value proposition** for all stakeholders :
  - for farmers : able to access services at their doorstep
  - for countries : improving last mile service delivery
  - for innovators : increase outreach because acquisition costs of farmers are high
- **Consistent support** for digital agriculture as the project is linked to the country's agriculture strategy
- **Timing** for public initiatives is key and has been well managed to respect financial year deadlines: training and mobilization before August, budgeting in August etc.
- The platform is well positioned within the ecosystems as startups work with other players in coordination when they are complementary, there is **no competition**
- The platform has been designed for the **scale up phase** so the **assessment of startup's maturity** had to be thorough and challenging to get in the cohort, making **startups and other stakeholders' interest** to work with the platform rise

Challenges :

- Accessing farmers and **bringing innovation into the field** has been a challenge making the Digital Agriculture pillar the most complex to implement
- Finding a model that allows to **support startups without focusing only on funding** has been a test and learn process
- **Acculturating** the staff and the different stakeholders is key for **capacity building** and for communication around innovation in general
- Data and **data privacy** issues
- **Governance around budget allocation** is a struggle as it needs to be approved by the treasury and the timeline before unlocking the money is longer than the startup's needs (i.e. **different velocities**)

Ghana Agricultural Sector Investment

Case study : a government backed country-wide initiative

Source : CNTA

Ghana Agricultural Sector Investment Programme

Case study : a government backed country-wide initiative

Ghana

Ghana Agricultural Sector Investment Program is a **government-led initiative** aimed at promoting and supporting agricultural development in Ghana. The program focuses on **enhancing productivity, competitiveness, and profitability** in the agricultural sector. GASIP works closely with farmers, agribusinesses, and other stakeholders to provide **financial and technical support, training, market linkages, and infrastructure development**.

Country-level context :

Ghana's agriculture sector is characterized by **vast agricultural lands** that provide opportunities for crop cultivation. However, certain crops are given priority over others, and the agricultural landscape varies between the northern and southern parts of the country. The northern region experiences dry conditions, necessitating the implementation of irrigation solutions to support agricultural activities.

In Ghana, **farmer-based organizations** play a significant role in the agricultural sector. These community-based organizations are established within each operational district and serve as a platform for farmers to **collaborate and address common challenges**.

One of the major challenges faced by smallholder farmers in Ghana is **finding a market** for their production. Due to **limited resources and market access**, smallholder farmers often have to **partner with larger companies**. However, the contract terms offered by these companies may not always be acceptable or favorable to the farmers.

Innovation in agriculture in Ghana is driven by the need for **improved productivity, production, and resilience to climate and weather conditions**. Agriculture plays a crucial role in the country's economic growth and development, with smallholder farmers comprising a significant portion of the sector's workforce. Their efforts contribute to the overall productivity and sustainability of the agricultural industry in Ghana.

Genesis of the initiative :

GASIP is a **nationwide private sector-led** value chains programme for smallholder farmers and agribusinesses with a **demand and market driven approach**.

Its mission is to contribute to **long-term poverty reduction** in rural areas of the country, and its aims at improving the **profitability** and **climate change resilience** of agribusinesses and smallholders.

The program has been implemented and supervised by the **Ministry of Food and Agriculture**. It is operated by a small team of 20 people leveraging on the ministry, the districts and other private sector implementers with whom they signed MoUs.

Ghana Agricultural Sector Investment Programme

Case study : a government backed country-wide initiative

Ghana

Ecosystem interactions :

At the forefront of the ecosystem are the **farmers**, who form the foundation of agricultural activities. To ensure their representation and active involvement, the Peasant Farmers Association of Ghana (PFAG), a prominent farmer-based organization, holds a position in the GASIP program's steering committee. Additionally, GASIP collaborates with 80 Farmers-Based Organizations (FBOs), which are crucial in **establishing a balanced relationship** between farmers and private agribusinesses.

The ecosystem also involves key partners and entities that provide **support and technical expertise**:

- The Centre for No-Till Agriculture (CNTA) plays a significant role in training farmers on **climate resilience practices**.
- The Ministry of Food and Agriculture's district departments offer **local technical assistance** to farmers
- the Department of Cooperatives strengthens farmer-based organizations, facilitating the formation of cooperatives and federations.
- **Irrigation support** is provided by the Ghana Irrigation Development Authority (GIDA) to farmers operating within designated irrigation areas, aiding them in **making informed decisions**. The Ghana Meteorological Agency supplies crucial **weather information** to farmers, enabling them to **plan their agricultural activities** effectively. The International Water Management Institute (IWMI) promotes efficient water usage technologies among farmers, contributing to sustainable practices.

The ecosystem also includes **strategic partnerships with agribusinesses**, wherein pre-arranged contracts are established to support farmers and facilitate the sale of their production.

The Ghana Commodity Exchange serves as a **critical link between farmers and the market**, connecting them to warehouses and enabling them to sell their products at their preferred time and price. To ensure program effectiveness, external consultants are engaged to conduct impact assessments, providing valuable insights and guidance for program development and refinement.

Actors involved :

Main partners

IFAD

MINISTRY OF FOOD & AGRICULTURE
REPUBLIC OF GHANA

Districts

Department of cooperatives

Agribusinesses

Other partners

THE HOWARD G. BUFFETT FOUNDATION
CENTRE FOR NO-TILL AGRICULTURE

GHANA IRRIGATION DEVELOPMENT AUTHORITY

GHANA METEOROLOGICAL AGENCY

IWMI International Water Management Institute

MINISTRY OF FOOD AND AGRICULTURE (MOFA)
GHANA AGRICULTURAL SECTOR INVESTMENT PROGRAMME

Ghana Agricultural Sector Investment Programme

Case study : a government backed country-wide initiative

Ghana

Operations :

The program operates through **three components**: (1) value chain development, (2) rural value chain infrastructure, and (3) knowledge management, policy support and coordination.

The program supports smallholder farmers in various ways::

- provision of **agricultural inputs** sourced from research and development partners and distributed through private agribusinesses such as fertilizers, seeds, pesticides, and weedicides, partially subsidized through a public initiative.
- Private agribusinesses offer **go-to-market support** by enabling farmers to contract the sale of their harvest and provide **mechanization** support through the provision of tractors and other equipment.
- **Technical support** is provided by local districts and experts from the Ministry of Food and Agriculture.
- **Financial training** is offered through the establishment of Village Savings and Loan Associations (VSLAs), where farmer-based organizations train farmers to self-own and manage community-based savings and loans.
- Farmers receive **soft skills training** in leadership and negotiation.

Infrastructure development is another vital aspect of the program. A demonstration site has been constructed to train smallholder farmers in **conservative agricultural practices** and **provide food**, primarily vegetables, outside of the regular harvest season. Agroforestry nurseries are established to educate farmers on seedling propagation techniques, promoting sustainable agroforestry practices.

Results and Impact :

By the end of 2020, the GASIP supported **49 000 smallholder farmers**, and this number reached **51 000 smallholder farmers** by the end of 2022. GASIP successfully worked with the district department of agriculture and the department of cooperatives to formalize **500 farmer-based organizations.**

A beneficiary assessment (surveys and 1o1 interviews) conducted by an private local external organization in 2020 demonstrated a **satisfaction level of 4.3 out of 5** for project's support and services.

Perspectives :

The program aims at **improving productivity for youth and women**, and by extension **improving income** to have better livelihood. It targets smallholder farmers with maximum 1 hectare, mostly youth and women in the **soya rice and maize value chains**. These sectors were chosen because they represent the food baskets of the country and a focus on those domaines allow to **reduce the food insecurity** among poor regions.

Ghana Agricultural Sector Investment Programme

Case study : a government backed country-wide initiative

Ghana

Financing :

The GASIP project had a total cost of US$113.0 million, and its financing was sourced from various entities.

- The primary financier was the **International Fund for Agricultural Development (IFAD)**, contributing through an IFAD loan of US$71.6 million and an IFAD ASAP (Adaptation for Smallholder Agriculture Programme) grant of US$10.0 million.
- Additional funding was secured from participating **financial institutions**, contributing US$17.5 million.
- The **Republic of Ghana** allocated US$7.6 million towards the project, while the **district departments of agriculture** provided US$1.7 million in funding.
- **Beneficiaries** were expected to contribute US$4.6 million, which could be in the form of cash, equipment, or human resources.

Furthermore, in response to the COVID-19 pandemic, a new project was designed and financed as an emergency relief measure. GASIP received an **additional funding** of US$20 million from IFAD specifically for **COVID-19 relief implementation**.

The majority of the project's expenses were directed towards **rural infrastructure development**, including the rehabilitation of 1,200 kilometers of rural roads and the establishment of 450 kilometers of rural electrical connections. Value chain development activities such as providing equipment, machinery, training, demonstration sites, and fertilizers also accounted for significant expenditures.

Investment :

The project was financed at 70% by the International Fund for Agricultural Development (IFAD).

IFAD

The rest of the financing comes from participating financial institutions, the Government of Ghana, the district departments of agriculture, and the beneficiaries.

MINISTRY OF FOOD & AGRICULTURE
REPUBLIC OF GHANA

Success story :

- Introduction of **user-friendly planting tools** that have a strong impact on the daily lives of women and youth, particularly in sectors dominated by them.
- Collaboration with the Ghana Meteorological Agency to establish weather stations and **deliver timely weather information** to farmers via mobile phones, enabling them to make better farming decisions.
- Implementation of an **efficient monitoring and evaluation system**, utilizing technology for instant data access and geolocation of investments across the country.
- Crop experiments conducted after training programs show a significant **increase in productivity**, with a notable improvement of **over 50%**.

Ghana Agricultural Sector Investment Programme

Case study : a government backed country-wide initiative

Ghana

Best practices :

- **Collaboration with agribusinesses**: working with established agribusinesses proved to be a valuable solution to the market access problem. The project also encouraged the f**ormation of new farmer-based organizations**, which were then integrated into the program.
- **Building a complete ecosystem**: the GASIP program recognized the importance of building a comprehensive ecosystem involving various stakeholders. This included engaging public and international entities to **establish supportive policies**, **secure funding** for the program, and **collaborate with the meteorological entity** to provide crucial weather information. Partnerships with private companies, particularly those directly involved in the agricultural value chain, were also fostered.
- **Comprehensive support for farmers**: the project emphasized providing farmers with all the necessary support to enhance their chances of success. This included **partially financing agricultural inputs** to alleviate financial burdens, **equipping farmers with negotiation skills** to interact effectively with larger market players, **facilitating access to financing options**, and **providing reliable weather information**.

Challenges :

- **Administrative constraints**: During the initial three years (2015 to 2018), administrative constraints hindered the development of the initiative. These constraints continue to limit the program's autonomy in implementing its activities, including constraints imposed on partners involved in the project.
- **Complex market access for farmers**: supporting farmers' production is insufficient if they are unable to find markets to sell their harvested crops. The lack of accessible and reliable market opportunities poses a significant challenge for smallholder farmers.
- **Pre-market contract challenges**: the GASIP initiative encountered difficulties in adhering to pre-market contracts with farmers, particularly when yields did not meet expectations. Farmers sometimes believed they could obtain better prices for their harvest than those agreed upon in pre-harvest arrangements. This discrepancy led to breaches of contract and trust issues within the value chain.
- **Limited engagement of commercial banks**: the program faced obstacles in engaging commercial banks as partners. Banks in Ghana often perceive the agricultural sector as high-risk and are reluctant to provide funds or credit to support agricultural initiatives. To involve commercial banks in the program, direct incentives, such as the creation of revolving funds managing the project's funds, would have been necessary.

Mohammed VI Polytechnic University

Case study : a University based ecosystem

Source : UM6P website

Mohammed VI Polytechnic University

Case study : a University based ecosystem

Morocco

Mohammed VI Polytechnic University is **a hub of education, research, innovation and entrepreneurship**, aspiring to become a solid bridge of knowledge between Morocco, Africa and the world. Located in the "Mohammed VI Green City" in Benguerir, near Marrakech, UM6P applies a **"learning by doing" approach** and develops sound partnerships with world-wide class universities, to promote leadership and training in focused research areas.

Country-level context :

Agriculture contributes to **14% of Morocco's GDP**, and combined with the fishing and forestry sectors employs about 31% of Morocco's workforce. It has an outsized impact on the economy due to highly variable rain-irrigation-based grain production, its role as an employer, and its role as a major export industry.

Morocco is home to **different climate conditions**, from the north (mediterranean weather) to the south (dry and hot).

The prevalence of small farms, complicated land title issues, and increasing land prices pose serious challenges to agricultural policy makers.

Two important initiatives related to agriculture were launched by the government to develop the sector :

- **"Plan Maroc Vert"** (2008) : develop large industrial agriculture but also smallholder farmers to fight rural poverty and have a social impact ;
- **"Generation Green"** (2020-2030) : develop a new agricultural middle class by supporting young entrepreneurs and promoting human and social development + modernization of agriculture.

Genesis of the initiative :

The **OCP Group** (Office Chérifien des Phosphates) is a semi-public company based in Morocco that accounts for **4% of the country's GDP** and that became the **first exporter of phosphate** in the world.

The Mohammed VI Polytechnic University (UM6P) was created in 2013 as a **subsidiary** of this group **by the OCP Foundation** and officially inaugurated by the King Mohammed VI in 2017.

The university was first created to create **a bridge between scientific research and the group's industrial activities,** offering searchers the resources they need to test their projects and accelerate innovation.

By working on **work on research, innovation and knowledge** with a focus on some specific verticals, the strategic vision of UM6P is to develop Morocco with a jump towards Africa and to **create unicorns and future leaders** / entrepreneurs on the continent.

Mohammed VI Polytechnic University

Case study : a University based ecosystem

Morocco

Ecosystem interactions :

UM6P has created subsidiaries dedicated to innovation and entrepreneurship such as :

- **StartGate** : a physical space of 3000 m2, open 24/7 to students, entrepreneurs etc.
- **U-Founders** : an incubation program that hosts more than 100 startups on 15 verticals
- **UM6P Explorer** : a program in collaboration with MIT Sandbox Innovation Fund that provides a personalized educational and business experience for entrepreneurs
- **Impulse** : a program to help AgriTech and BioTech startups have access to a market

In addition to these initiatives, a **training program** called “Entrepreneur Academy” has been developed to teach entrepreneurship skills to future leaders and two funds were launched to work as the investment arm of UM6P programs :

- **UM6P Ventures** : early stage VC fund specialised in digital transformation and deeptech ventures
- **Bidra Innovation Ventures** : VC focused on agriculture, water, mining and energy

UM6P has developed several types of partnerships :

- With **academia** : more than **270 research programmes** developed with universities in Morocco and abroad (HEC Paris, Columbia University, Sciences Po, McGill University etc.)
- With **private companies** : such as open innovation with Royal Air Maroc or hospitality development with Hilton Group
- With **public actors** : to develop programs aligned with the country’s interests, such as the MRTB with the Ministry of Industry
- With **innovation programs :** such as Plug and Play Tech Center that offers a vast network of international startups
- With **NGOs** : to collaborate with local associations as operational partners on the ground
- With **experts** : to mobilize individual advisors depending on the needs of the programs

Actors involved :

The group :

OCP

The university :

MOHAMMED VI POLYTECHNIC UNIVERSITY

Innovation programs :

STARTGATE EXPLORER U-FOUNDERS

Funds :

UM6P VENTURES Bidra

Partners :

royal air maroc

HEC PARIS

non exhaustive list

Mohammed VI Polytechnic University

Case study : a University based ecosystem

Operations :

UM6P is not only specialized in AgTech but is focused on **verticals that are aligned with the OCP group's strategic vision** such as food security, industrialisation, sustainability, digital mining, human sciences, agritech, cleantech, fintech etc.

In addition to the 4500 students, there are thousands of UM6P staff so they are **divided into teams within the UM6P's subsidiaries to facilitate governance** and decision making processes. Apart from the core team, external consultants and expert advisors are solicited to work on specific projects or coach the startups within the programs. The **startup coaches are usually all past entrepreneurs**.

An tailored-made entrepreneurship coaching provided by entrepreneurs :

- UM6P considers that entrepreneurs can only be properly **coached by former or current entrepreneurs**: whether these people have failed or succeeded, they have their own experience of entrepreneurship, and are able to give advice on the basis of this experience, not on the basis of what they read in a book or heard in a podcast.
- The training is **modular** and **adapted to each project** and the needs of entrepreneurs, as well as their development phase.
- **600 startups** have been coached last year.

Perspectives :

The priorities of development for UM6P are to launch initiatives in line with Morocco's priorities such as **water stress, social impact, gender issues, etc.** The impact factor is indeed at the center of the university's vision as the objective is to facilitate **social and territorial inclusion** of the population and develop solutions that are **sustainable for the planet**.

By contributing to the training of a new generation of Moroccan and African researchers, entrepreneurs and leaders, UM6P is committed to positioning Morocco as a country **at the forefront of technology and human sciences**. and align these different actors on shared values that are beneficial to the country and the continent.

Mohammed VI Polytechnic University

Case study : a University based ecosystem

Morocco

Financing :

UM6P is a **non profit university** that is **fully financed by the OCP Foundation**.

FONDATION OCP

A part of UM6P financing is dedicated to the management of all the different activities but also to **support the students** of the university through subsidies for their daily expenses and helping unfavorised and isolated populations get into the school (i.e. 70% of the fees are financed by the foundation).

Some subsidiaries of the university have however a financial interest such as the VC funds that are looking for a **return on their investments**.

Investment :

Some startups that have been invested in by Bidra Innovation Ventures :

Apollo Agriculture · AgroSpheres · NIQO ROBOTICS · Pattern Ag

Some startups that have been invested in by UM6P Ventures :

AKORN TECHNOLOGY · De Novo Foodlabs · SensThings · OCP MAINTENANCE SOLUTIONS · Biotic · terraa · Logidoo

Success story : AGRIYOUNG INNOVATE

AgriYoung Innovate is a **challenge launched by the Ministry of Agriculture** and the **Agency for Agricultural Development**, in partnership with UM6P and especially the P-Curiosity Lab. Inspired by the “Generation Green”, the goal is to **reinforce the entrepreneurial ecosystem in rural areas** and support young entrepreneurs in the digital agriculture and climate smart sectors. **20 projects were selected** from almost 300 applications and the 4 winners gained access to a **coaching program** within UM6P for several months as well as access to several services and facilities (expert advice, networking opportunities, training program, Fab Lab, experimental farm etc.) : PGPR Technologies (biostimulants production), Deepleaf (deep learning for detecting plant diseases), Behav (eco-design of materials), UniVert Energy (biogaz production from household waste).

Mohammed VI Polytechnic University

Case study : a University based ecosystem

Best practices :

- By **co-creating programs** with the public and private sectors on specific subjects, a part or the totality of the budget can be supported by the partner and allows to keep the programs free for the beneficiaries and remain attractive
- Is is important to provide different yet **complementary initiatives** in order to **meet the needs** of the (future) entrepreneurs, such as :
  - a physical location for those who launched their startups but do not have offices yet
  - an online soft skills training for students who want to learn at the same time as their studies and even before starting their own project
  - a fund for startups that are investment ready
  - an acceleration program for teams that need operational support
  - ...
- Having **multiple IP strategies** in place allow to offer a personalized approach that will suit the researcher but also UM6P and ultimately protect all innovation created within the group
- Recruiting **coaches that are previous entrepreneurs** is key to make sure they have the right skills and approach to help the startups
- Giving **access to the OCP Group** for startups that wish to develop their Proof of Concept (POC) and placing them at the center of academia with access to a pool of talent speeds up their development

Challenges :

- It is still culturally difficult to see entrepreneurship as a job : students are incentivized to finish their studies as there are **no unemployment benefits** for entrepreneurs
- Players from the agricultural sector do not necessarily want to change their ways of working and can be a burden to innovation : there is a **need to instill a new mindset** through collaborations, education of all stakeholders and personalized support
- It is important to provide optimal conditions to the students and entrepreneurs through free housing, food and soon grants but this comes at a **financial cost**
- It can be difficult to align the priorities of all the players participating in an initiative : **a clear assessment of their interest** and reasons behind it needs to be done before launching an initiative to avoid risks of lobbying or coordination failure

Proparco

Case study : a DFI initiative in Africa

Source : Proparco website

Proparco

Case study : a DFI initiative in Africa

France

Proparco is **a development finance institution (DFI) that operates as a subsidiary of Agence Française de Développement (AFD), the French development agency.** Proparco specializes in private sector financing for sustainable and inclusive economic development in emerging and developing countries. It collaborates closely with local partners, governments, and other development institutions to promote inclusive and sustainable economic growth.

Country-level context :

Proparco has a global presence, with offices in Paris, France, and regional offices in Africa, Asia, Latin America, and the Middle East. Proparco has offices in **several countries in Africa**, including Madagascar, Burkina Faso, Ghana, Senegal, Egypt, Tunisia, Ivory Coast, Morocco, Cameroon, Nigeria, and Kenya. These offices are **strategically located to facilitate close engagement with local businesses, financial institutions, governments, and development stakeholders in each respective country.**

The agricultural sector in Africa :

- **The sector is diverse**, encompassing a wide range of crops, livestock, and agro-based industries. It serves as a crucial source of income, food security, and rural development across the continent.
- **The sector's contribution to Africa's GDP varies by country, with some countries heavily reliant on agriculture as their primary economic activity.**
  - On average, agriculture accounts for approximately 15% to 30% of the GDP in African countries. Additionally, it employs a substantial portion of the workforce, often exceeding 50% in rural areas.
- **The challenges in the sector across Africa include limited access to finance, inadequate infrastructure, land tenure issues, and low adoption of modern farming techniques.**
  - Smallholder farmers constitute a significant proportion of Africa's agricultural workforce, often facing constraints such as limited access to markets, technology, and resources.

Genesis of the initiative :

Proparco was **created in 1977 with the primary objective of facilitating private investment in Africa.** In 2018, the organization expanded its operations by **launching a venture capital (VC) program**. It began with a budget of 150 million euros, aimed at fostering investments in funds and startups.

Proparco's activities encompass **a range of support mechanisms, including investments in funds and startups, provision of expertise, board observation and advisory services, as well as networking and communication support.**

As a subsidiary of AFD, Proparco collaborates closely with its parent company. AFD focuses on innovative initiatives, providing support to entrepreneurial structures and ecosystems through financing incubators, accelerators, and dedicated seed/preseed programs. In contrast, Proparco primarily engages in equity investments in funds and startups, forming a continuum between AFD's public-side support for ecosystems and Proparco's direct investment activities.

Ecosystem interactions :

Proparco's ecosystem interactions involve various connections and collaborations to support its operations and create a favorable environment for its activities :

- **Connections with Incubators** from the AFD network, such as bond'innov and greentech capital to access a pipeline of potential investment opportunities.
- **Connections with Financial Consulting Firms**, including those specialized in mergers and acquisitions (M&A) or fundraising. These interactions mainly involve information exchanges and knowledge sharing.
- **Engagement with Local Governments and Agencies** could be processed during the due diligence process in the countries where they operate. This engagement helps ensure compliance with local regulations and facilitates the necessary approvals.
- **Proparco and AFD Collaboration through its dozen offices in Africa.** Proparco leverages AFD's networking opportunities and event partnerships. On the other hand, AFD provides expertise support and works towards creating a more favorable ecosystem for Proparco's operations.
- **Collaboration with European Development Finance Institutions** (DFIs) such as DFG and FMO through quarterly calls. These discussions focus on specific topics and pipeline opportunities, fostering cooperation and knowledge sharing.

Proparco relies on a combination of public and market funding to support its investments. The objective is to generate a return on investment (ROI) comparable to that of investment banks, ensuring financial sustainability. Proparco is **primarily involved in equity investments, providing capital to startups and businesses.** During the investment phase, Proparco engages in **discussions with founders to identify areas where it can add value through technical assistance, expertise, networking and communication.** After making initial investments, Proparco maintains **an active presence by participating in the Board of Directors** of the invested startups. Proparco can **provide support from the European Social Fund (ESF)** which provides additional resources and assistance to promote social and economic development.

Actors involved :

Member:

EDFI European Development Finance Institutions

Collaboration:

FMO Entrepreneurial Development Bank

KFW DEG

IFC International Finance Corporation WORLD BANK GROUP

Accredited:

GREEN CLIMATE FUND

UNION EUROPÉENNE

Shareholders:

bpifrance

Aga Khan Fund for Economic Development

DBSA

Operations :

Through its investment activities, **Proparco invests in fund managers (investment vehicles) that take equity stakes in companies**, aiming to maximize impact and long-term sustainable growth :

- These funds typically **have a duration of around 10 years**, with the possibility of a 1-2-year extension and sometimes open-ended funds.
- The fund managers **make investments during the investment period and manage exits**, similar to a normal fund, while Proparco delegates fund management to these experienced managers.
- **Proparco's investment portfolio includes investments in startups** (approximately 20) **or funds that take equity stakes in startups**, often focusing on specific themes.

Proparco's operations extend beyond financial support, as **it provides funding, technical assistance, expertise from field experts of AFD, a network of partners, and increased visibility** to the startups it invests in.

While the accessibility of data, particularly financial and market information, **poses problems and complicates the investment process**, it does not prevent Proparco from investing.

Bridge Fund by Digital Africa :

The Bridge Fund by Digital Africa, in collaboration with Proparco, addresses the challenges faced by young innovative African companies affected by the economic impact of the Covid-19 pandemic :

- This **new financial instrument serves as a bridging loan**, offering support to companies whose fundraising efforts have been delayed or canceled due to the global economic crisis.
- With **a budget of €5 million**, the fund aims to provide packages ranging from €200,000 to €600,000, which **will be co-financed by institutional investors with existing investments in Africa.**
- The **fund targets digital-focused companies that are at least 18 months old and have received prior funding**. The sectors covered include **agriculture, energy, education, health, financial inclusion, logistics, and green mobility.**

Perspectives :

Currently, **Proparco's geographical scope encompasses all of Africa, with plans for expansion into Asia in the medium term, prioritizing countries such as India and Latin America.** From Proparco's perspective, further development of the agtech sector in Africa requires increased government involvement due to the financial limitations of the market. Traditional projects, such as processing, are easier to implement than agtech projects, potentially due to the maturity of the ecosystem. There is **a significant need for processing infrastructure and value-added product creation directly within Africa.** However, **technology adoption may need to be tailored to the specific needs of African farmers.** Onboarding farmers onto platforms is challenging, particularly due to the dispersed nature of farmers in some regions like Kenya, resulting in high customer acquisition costs and low income per producer.

Financing :

Proparco's **financing model revolves around investments aimed at generating a return on investment (ROI) and supporting sustainable development :**

- As a subsidiary of Agence Française de Développement (AFD), Proparco **obtains financing through the markets**, utilizing AFD's treasury department to raise funds for both AFD and Proparco.
- Proparco's **business model involves investing in fund managers who act as intermediaries**, pooling resources and expertise to identify investment opportunities that align with Proparco's objectives :
  - **These investments primarily focus on startups or funds that take equity stakes in startups**, with ticket sizes ranging between 500k and 5M dollars. The strategy primarily targets pre-Series A, Series A, Series B, and occasionally Series C and Series D funding rounds.
  - **The investments are primarily made in sectors aligned with AFD's five priority sectors, with a specific emphasis on projects located in Africa.** Proparco aims to support companies that generate most, if not all, of their sales in Africa and have their operating costs predominantly based on the continent. While Proparco rarely acts as a lead investor, the financing rounds require the presence of a credible lead investor.

Investment :

Investment perceived:

MINISTÈRE DE L'EUROPE ET DES AFFAIRES ÉTRANGÈRES
Liberté Égalité Fraternité

MINISTÈRE DE L'ÉCONOMIE, DES FINANCES ET DE LA SOUVERAINETÉ INDUSTRIELLE ET NUMÉRIQUE
Liberté Égalité Fraternité

UNION EUROPÉENNE

Investment made:

FEFISOL

SIDI SOLIDARITÉ INTERNATIONALE POUR LE DÉVELOPPEMENT ET L'INVESTISSEMENT

ARAF Acumen Resilient Agriculture Fund

moringa

agrif by Incofin IM

Injaro

partech

Success story :

African Private Equity Fellowship — AN INITIATIVE BY PROPARCO GROUPE AFD

Proparco has launched **the African Private Equity Fellowship, a unique training and networking program dedicated to investors on the African continent. The fellowship offers talented young professionals in the private equity, private credit, and venture capital sectors the opportunity to connect with industry peers and experienced professionals through an executive program.** It includes interactions with renowned investors, case studies, a MOOC, mentoring, and more. The program aims to enhance knowledge, skills, and professional networks, with the first cohort starting in January 2023. The fellowship is part of the Choose Africa initiative, It is led by Proparco in collaboration with France Invest and the Campus AFD and operated by Inskip.

Proparco

Case study : a DFI initiative in Africa

France

Best practices :

- **Continuum of investment players:** Proparco follows a continuum of investment players to ensure the financing of projects at all stages, allowing for comprehensive support throughout the project lifecycle.
- **Different financing tools for different contexts:** Proparco employs a range of financing tools tailored to the specific contexts of projects, enabling flexibility and optimal funding structures.
- **Complete span of activities:** Proparco engages in a complete span of activities, including investment, operational support, technical assistance, and networking, to provide comprehensive support to the ventures it invests in.
- **Success in platform connecting producers and farmers:** Proparco has experienced positive results in the AgTech sector with platforms that connect producers and farmers, particularly in the context of export-oriented activities.
- **Success in decision-support tools for producers:** Proparco has witnessed positive outcomes with the implementation of decision-support tools for producers, enhancing their capabilities and productivity in the agricultural sector.

Challenges :

- **Fragmented markets:** Proparco faces challenges due to the complexity of operating in diverse and fragmented markets.
- **Regulatory compliance:** Adapting to changing regulations and ensuring compliance appeared as a real deal breaker.
- **Ecosystems are more developed in some countries than others :**
  - a different development level of support structures depending on the country
  - the diversity of business environments varies the ease with which businesses can be set up in different regions, adding to the complexity
  - navigating diverse business practices and cultural differences requires careful consideration and adaptability
- **Macroeconomic impact:** Fluctuations in local currency value can impact project returns, affecting the financial viability of investments.
- **Data accessibility:** Obtaining reliable and comprehensive data can be challenging, hindering the investment decision-making process.
- **Working capital financing:** Securing sufficient funds to support the working capital needs of startups is a key challenge for Proparco.
- **Talent recruitment:** Attracting and retaining skilled professionals in the AgTech sector presents recruitment challenges for Proparco.

AgriG8

Case study : an AgTech startup

Source : Techonomy

AgriG8 is connecting smallholder farmers to financial institutions to **improve access to short-term finance, by tackling the risk perception gap and leveraging risk mitigation strategies.** The startup developed a crop modeling system with a multi data sourcing approach to gather data and insights and make them available to financial institutions so that they can properly assess the risk of lending to farmers.

Country-level context :

There are about **70 million smallholder farmers** in South East Asia; these people are often **the poorest people** in their region and they struggle to generate enough income or even feed their family. This situation makes it difficult for a company to build a business model around them.

The increase in mobile ownership and coverage has led to an increased use of digital technologies. These **technologies are used by farmers to improve productivity, market access and lending**. Around 2015, a new digital wave brought agriculture innovations allowing smallholder farmers to trace the origin of agricultural products and drive efficiencies in value chains.

As of today, the support that goes to rice production goes through non commercial funds such as charitable organizations or development institutions. This way is not sustainable on the long term.

The key drivers of the AGTech sector in the region are **climate change and food security**, especially in Singapore where there is not enough land to produce the food required to feed everyone. For this reason, the local investment funds are particularly interested in vertical farming and alternative proteins.

AgTech is a complex industry, broken into many different segments. Few segments are currently generating revenue, apart from projects aiming at providing **market access** (marketplaces). The others are struggling to be profitable.

Genesis of the initiative :

AgriG8 is an **early-stage startup established in 2021 in Singapore and operating over South East Asia**. After more than 10 years of experience in the rice industry (seed production, seed research, contract farming, policy), David Chen launched Golden Sunland Singapore Pte Ltd, a value chain enabler. A pivot after the COVID crisis led to the creation of AgriG8 to **tackle the big issue of farmers short-term financing.**

As of today, farmers get access to this type of financing through microfinance, informal lenders, or “buy now pay later” schemes for which interest rate are very high, which locks farmers in a debt cycle and prevent them from being able to recover from formal shocks, such as a weather catastrophe.

By stepping in the shoes of financial institutions, AgriG8 understood the **key information banks needed to lend money to farmers**: credit risk assessment data and information on the short-term use of funds by farmers.

AgriG8 built a **crop modeling model** to provide this information and **convince financial institutions** to consider this portfolio of farmers, as well as create **economies of scale through aggregation**: by avoiding each player to look for its own data, AgriG8 reduces the final costs borne by farmers.

AgriG8 received an investment from the Trendlines Group in 2022 and participated in their acceleration program.

Ecosystem interactions :

AgriG8 works with all stakeholders of the ecosystem as the system **aggregates data from all players** (inputs providers, insurance companies, banks, etc.). **Apart from financial institutions, all other players get access to the consolidated data for free,** as it allows them to **operate and participate in improving access to finance.** Financial institutions pay for this data because they then get access to a new portfolio of customers and have access to updated information on farmers.

- AgriG8 participated in the **acceleration program** of Trendlines Group. They came out from this experience with a completely different business model and a focused revenue target, adjusting their language to their target (banks) rather than farmers. The program allowed AgriG8 to understand that they had to **address financial institutions' challenges** to solve the problem of farmers' short-term financing. Trendlines also brought in expertise on missing skills, providing a needed diversity to the AgrigG8 team.
- AgriG8 collaborates with various startups that bring **complementary services**, such as a European-based startup doing **image recognition for crops and diseases**, a functionality that is now integrated into the software to give additional services to farmers. AgriG8 also previously worked with satellite companies, but the associated services are now provided through their collaboration with Google Earth Engine.
- AgriG8 has close relationships with the **research's world**, as it conducts ongoing work with the MIT (Singapore - MIT Alliance for Research and Technology - SMART) and work closely with the sustainable rice platform.
- The startup works with **public actors such as GIZ**, a German development agency, and the government of Singapore, which allocated a grant to AgriG8 to explore how to use tech to convince financial institutions to invest in smallholder agriculture.

AgriG8 benefits from the very **favorable legal framework** of Singapore when it comes to innovation in agriculture, and provides grants through different the **Monetary Authority of Singapore (MAS)**, such as **Startup SG Tech** providing POC (Proof of Concept) and POV (Proof of Value) grants to tech startups, or the **Regulatory Technology Grant** providing support to startups enhancing financial institutions' risk management and regulatory compliance thanks to digital solutions.

The team did not patent any of its products: the crop modeling system is not patentable because it is inspired from previous research and corresponds to an improvement of an existing process. The crop modeling system was built by the CTO of AgriG8. The user interface was not patented either because of the complexity of this process compared to the value of a patent for such output.

Actors involved :

Main partners:

golden sunland
Growing Rice, Growing Lives.

trendlines

Academic partner:

SMART
Singapore-MIT Alliance for Research and Technology

Public partners:

MAS Monetary Authority of Singapore

Corporate partner:

Google Earth Engine

Operations :

AgriG8 is **building a crop modeling system with a multi data sourcing** (farmers and satellite data). The system uses proxies and indices of the last 5 years to forecast farmers' future activity and revenues. The system is fed with data coming from satellites and farmers themselves, who record them through an app built with a gamified user interface to facilitate adoption and usage.

The required data is hard to collect as the startup **needs to understand the boundaries of the farmers' land and pull data** from different satellites from 5 years in the past.

AgriG8 **brings inputs and fertilizers companies on the platform** so that funds lended by banks are spent directly on these elements and the bank is assured that farmers are using the lended funds for what they were aimed to.

AgriG8 has currently **5 full-time and 4 part-time employees**, and is running **pilots in Indonesia, Vietnam, and Thailand**. The startup has a board of directors with annual board meetings since the investment from Trendlines Group.

Adaptation to real needs :

AgriG8 designed an **app for farmers for data recording** and **adapted it to the real needs** of farmers on the ground :

- They studied the **usage patterns of farmers** and realized that they were using their phone for non-professional activities (watch videos, play, etc.). In the market, there are a lot of apps that are designed in a professional way and that farmers do not use because they are not at ease with the user interface.
- AgriG8 therefore adopted a **behavioral game mitigation approach**: because they considered that a digital tool had to be built in a way that correspond to the usage of farmers, they simplified the tool them to reduce frictions and facilitate customer adoption.
- The app possesses a **game-like interface**, easy and friendly to use by the end-customers, the farmers.

Perspectives :

AgriG8 plans to **expand in other countries** but will **limit its geographical expansion to South East Asia**, because their knowledge of the sector and its needs and challenges is based on this market.

Scalability is a complex topic for the startup. AgriG8 started talking to agrochemical firms who have access to farmers to scale but is concerned about the implications of partnerships with a big player of the industry and the possibility to work with several big corporations that are competitors: for example, will they be able to work with Bayer and Syngenta at the same time?

Financing :

Financial institutions are the clients of AgriG8. The startup is **assessing and mitigating the risk for them**, as well as **providing new portfolio for lending.** They are charged for each transaction.

The revenue model is composed by 2 elements :

- **Onboarding fee** to be paid when they aggregate farmers are aggregated into a portfolio that is presented to financial institutions
- **Success fee** to be paid when the lended funds are successfully returned from farmers

Revenues are recurring: the bank keeps being engaged over time because AgriG8 is doing risk assessment and mitigation on the long run: each season, new data is to be taken into account based on how the farmer performed, and interest rates must be raised or lowered based on this updated information.

Raising funds in this sector is complex; AgriG8 is focused on the rice industry, a segment that is not among the 4 regional priorities: vertical farming, alternative proteins, aquaculture, and e-commerce.

Investment :

Seed round in 2022 with Trendlines Group through the Trendlines Agrifood Fund.

trendlines

Success story :

AgriG8 is building a **unique service on the market thanks to 2 key differentiators**: direct contact with farmers and crop modeling system with a multi data sourcing approach:

- AgriG8 has been able to interact directly with farmers, whereas most of their competitors have given up on this and developed software for farm agents who collect data from 50 different farmers. AgriG8 tried to **make farmers to be data providers and data owners** themselves, for two reasons:
  - this is the best way to protect farmers' data and ensure data privacy
  - it is part of the AgriG8 unique value proposition, meaning their way to differentiate themselves from competitors and stand out in the market
- Plus, most AgriFinTech players use transactional data such a: what farmers buy, if they have paid the inputs suppliers in the last months, etc. AgriG8 is using **crop modeling and remote sensing data** as a tool to **understand the activity of farmers for the last 5 years**, mainly with agronomy data and satellite imaging. They use several indices and proxies to correlate with future activity and revenues of farmers and therefore provide more reliable data.

AgriG8

Case study : an AgTech startup

Singapore

Best practices :

- **Customized go-to-market strategy:** faced with the challenge of market fragmentation in South East Asia, with each country having its own specificities and challenges, its own language, etc; AgriG8 built a specific go-to-market strategy relying on local partners already having market access.
- **Collaborating with local partners:** they were able to analyze needs of partners and ensure a win-win situation by working with them, tackling the challenge of collaborating with different players having their own constraints.
    - For example, AgriG8 worked with GIZ, a German development agency with high requirements on data regulations. This led to 9 months of discussions to formalize the partnership.
- **Educating farmers on data regulations:** the key challenge they were able to overcome was to find a balance between the constraints of GIZ, focused on data security, and the needs and situation of farmers, who do not understand properly data regulations and implications, and who must therefore be educated on the topic. To this aim, AgriG8 created documentation to help farmers understand their rights as well as the value of data, and make them able to agree on data aspects with proper knowledge.

Challenges :

- **Finding and hiring talents:** being based in Singapore, it is difficult to find people having adequate skill set in agronomy, smallholder farmers experience, etc. AgriG8 had to focus on finding motivated people to compensate for this lack of skill set and consider that the more specific required skills would be learned at the company. Finding developers is also a tough challenge for a startup in Singapore that does not have a lot of cash, as they ask for high salaries.
- **Slower growth:** AgriG8 was a lot slower than expected because it appeared very complex to convince financial institutions of the relevance and safety of the solution, considering that AgriG8 did not have big projects as references. AsriG8 had to put resources on their end to convince of the viability and effectiveness of the model. AgriG8 financed a few pilot projects.
- **Legal challenges and data privacy:** because they are partnering with European players, they must comply with the General Data Protection Regulation (GDPR) on data privacy. European investors and partners are imposing the compliance of this regulation that is very advanced and strict for the region.
- **Intellectual Property (IP) agreement with research institutes:** AgriG8 was not able to find an agreement on IP with research; they had discussions with Singapore Research Institute but they could not agree on the IP strategy: they required major ownership of the IP while the team accepted 50/50 maximum. AgriG8 hired a CTO to rebuild a complete model.

Trendlines Group

Case study : a VC fund specialised in AgTech / FoodTech

Source : Israel21C

Trendlines Group

Case study : a VC fund specialised in AgTech / FoodTech

With a focus on **medical, agricultural, and food technologies**, Trendlines actively seeks out promising startups in these sectors and provides them with financial support, strategic guidance, and industry connections. By leveraging its **expertise** and **network**, Trendlines plays a vital role in accelerating the growth and commercialization of innovative AgTech and FoodTech solutions.

Country-level context :

AgTech innovations in Israel are fueled by the **country's high-tech entrepreneurial mindset** and the **accumulated expertise** gained from overcoming internal agricultural challenges. With a strong emphasis on **technology** and **innovation**, Israel has emerged as a global leader in AgTech.

In contrast, AgTech innovations in Singapore are primarily driven by the **pressing need for food security**. While Israel fosters an entrepreneur-friendly mindset, Singapore tends to be more risk-averse in its approach. The AgTech sector encompasses a **wide range of topics, each presenting unique challenges**.

Key challenges include the **lengthy production cycles** involved in agriculture and the complexity of addressing specific issues within the sector. Despite these challenges, both Israel and Singapore are actively investing in AgTech to address pressing agricultural and food-related concerns.

Genesis of the initiative :

Trendlines is an Israel-based investment company founded in 2007. As a publicly-traded company, it specializes in **early-stage investments** in agriculture, food technologies, and medical device technologies. These sectors were chosen due to their significant **impact on improving the quality of life** and their **potential for large market opportunities**, making them attractive and potentially profitable for investors.

Trendlines has made over a hundred investments, resulting in a diverse portfolio that currently comprises 58 companies, with 26 in Ag/FoodTech and 32 in MedTech. The company has successfully operated 10 exits, demonstrating its ability to support startups from their early stages to successful outcomes.

Recognizing Israel's expertise in overcoming geographical challenges and the **untapped potential in the AgTech sector**, Trendlines seized the investment opportunity in the country. In Singapore, Trendlines expanded its operations to **support the government's initiatives** aimed at addressing food insecurity and developing the AgTech and FoodTech ecosystem.

Trendlines Group

Case study : a VC fund specialised in AgTech / FoodTech

Ecosystem interactions :

Trendlines operates within a dynamic ecosystem where **various stakeholders collaborate to drive AgTech innovation** :

- They leverage **government funding and support**, securing non-dilutive grants for early-stage startups. A partnership has been established with the Singaporean government through Temasek to invest in the region and foster the development of the local AgTech ecosystem.
- **Industry partners** play a crucial role, providing immediate connections with local, regional, and international companies, ensuring that innovations address actual market needs and benefit from industry expertise.
- Collaboration with **academia**, particularly in **applied research and technology transfer offices,** facilitates the **integration of cutting-edge research** into practical solutions.
- Trendlines engages with **farmers** as early adopters. **Networks of farmers** and **cooperatives** serve as key opinion leaders, playing a critical role in the **adoption and integration of new technologies** and allocating land to **test innovative solutions** and get valuable **insights into market needs**.
- The company forms **ad-hoc partnerships** with global companies, investors, and players based on the specific requirements of their portfolio companies. Active participation in conferences brings together stakeholders from Israel and abroad, fostering **knowledge exchange and networking opportunities**.
- Additionally, Trendlines collaborates with companies to create **funds** dedicated to investing in specific topics, exemplified by their partnership with Bayer for the Bayer Crop Science initiative.

Actors involved :

Main partners for venture funds:

TEMASEK

BAYER

Partners Innovation labs :

B|BRAUN

Röchling

WASTON® MEDICAL

Natali Healthcare Solutions

Non exhaustive list

Trendlines Group

Case study : a VC fund specialised in AgTech / FoodTech

Operations :

Trendlines operates as an investment and support organization for early-stage startups in the AgTech, FoodTech, and MedTech sectors.

With a team of approximately 40 people, they provide extensive support to their portfolio companies. **Startups are incorporated within Trendlines' incubators or accelerators** for a minimum of 2-3 years, benefiting from the expertise of business development professionals.

Trendlines has **established connections** with numerous global players, which enable them to create **strategic partnerships** and expand their **network**. They also hold seats on the boards of their portfolio startups, **providing guidance and oversight**. In addition to investments, Trendlines offers **comprehensive overhead support**, covering office space, accounting, legal, and other necessary services during the initial years of a startup's journey.

Trendlines has a preference for companies with **strong intellectual property** (IP), including cases where IP is protected as know-how rather than filed as patents. Many projects within Trendlines are based on innovative discoveries made by researchers.

Israel / Singapore : dealing with two distinct visions :

Israel and Singapore exhibit distinct characteristics in their agricultural and innovation landscapes.

- **Singapore's rapid development** can be attributed to the **government's strong push**, proactive approach in seeking partnerships, and significant investments. The country's limited land availability has directed its research focus towards fermentation technology, which can be implemented in small spaces. In contrast, **Israel has regional research centers** that cater to diverse agricultural conditions due to varying geographical factors.
- While Singapore prioritizes **food security** and finding solutions for growing conditions and climate change, Israel stands out as a **self-sustained nation with a high-tech culture** that transfers expertise from sectors like pharma and cybersecurity to agriculture.
- Despite **both countries being small and targeting international markets**, Israeli startups tend to target the US and Latin America due to their sizeable markets, while Singaporean startups are encouraged by the government to attract entrepreneurs from other countries and often focus on East Asia for market expansion.

Perspectives :

While there are no immediate plans for international expansion, Trendlines recognizes the importance of **building a complete ecosystem** to do so successfully. Both in Israel and Singapore, the **legal frameworks support innovation** through financing opportunities, administrative support for entrepreneurs, and fostering open discussions with other innovation players.

Trendlines Group

Case study : a VC fund specialised in AgTech / FoodTech

Israël

Financing :

Trendlines is structured as an investment company, holding equity in various portfolio companies and serving as General Partners in funds.

As a **publicly-traded company**, Trendlines raises funds globally. Risk analysis is conducted on a case-by-case basis, recognizing that venture funding inherently involves risk and therefore embraces it. To mitigate potential risks, liability insurance is provided for directors sitting on the board of companies.

The main challenge in investment lies in the fund's timeline, which expects exits within 4-8 years. This **timeline shapes the investment strategy**, focusing on companies at the right stage with significant market potential and a likelihood of successful exits on the medium term. However, a **lack of sufficient entrepreneurial pipeline** poses a challenge, as there are not enough viable projects to invest in.

Investment :

Trendlines Group is a publicly-traded company that obtains financing from Limited Partners and capital gains generated from successful exits. The venture funds also receive financing from Limited Partners and capital gains from exits. Additionally, these venture funds form partnerships with other entities, such as co-creating funds with other venture funds, collaborating with the public sector in public investment initiatives, or partnering with organizations dedicated to sector development.

Investments made :

AgTech

AgroScout Detection Done Right

Phytolon Natural Food Colors

agwa

AgriG8

MedTech

VIAQUA THERAPEUTICS

VESSI MEDICAL

Success story :

- Trendlines has formed a partnership with **Temasek** in Singapore to **foster the development of the AgTech ecosystem in South-East Asia**. This collaboration implicated the co-creation of a venture fund and an acceleration program dedicated to supporting early-stage AgTech startups in the region.
- One of the notable projects within Trendlines' portfolio is **Phytolon**, an AgTech initiative focused on **developing healthy, efficient, and sustainable natural food color alternatives**. Phytolon successfully secured a Series A funding round of $14.5 million in 2022. Additionally, the project was recognized as one of the top 30 global startups at Slingshot 2019, a renowned Asia's DeepTech startup competition.
- Another remarkable venture in Trendlines' portfolio is **Agroscout**, which utilizes **AI-driven analytics to enable early detection and monitoring of crop diseases**. Agroscout raised $7.5 million in a Series A funding round in 2021 and has been generating revenues through its innovative platform.

Best practices :

To create a complete ecosystem for AgTech and FoodTech innovation, Trendlines leverages and encourages these best practices :

- **Government support**: establish funding programs specifically designed for early-stage startups in the sector.
- **Venture capitalists** (VCs) and other **financial investors participation**: encourage VCs and financial investors to take an interest in AgTech and FoodTech at an early stage, gradually replacing government funding.
- **Industry partnerships**: foster immediate connections with local, regional, and international companies to ensure that innovations meet actual market needs and benefit from industry expertise.
- **Academia and research institutions collaboration**: promote collaboration with academia and research organizations, particularly in applied research and technology transfer offices, to leverage scientific expertise and drive innovation.
- **Entrepreneurship ecosystem**: engage with incubators and accelerators worldwide that focus on encouraging entrepreneurship and imparting associated skills, such as mindset development and go-to-market strategies.
- **Farmers' involvement**: recognize farmers as valuable stakeholders in the ecosystem, as they can serve as early adopters,
- **Networks of farmers and cooperatives**: collaborate with farmer networks and cooperatives, leveraging their role as Key Opinion Leaders to facilitate the integration of new technologies into farmers' lives. They may also be able to provide land for testing solutions, and offer insights into actual market needs.

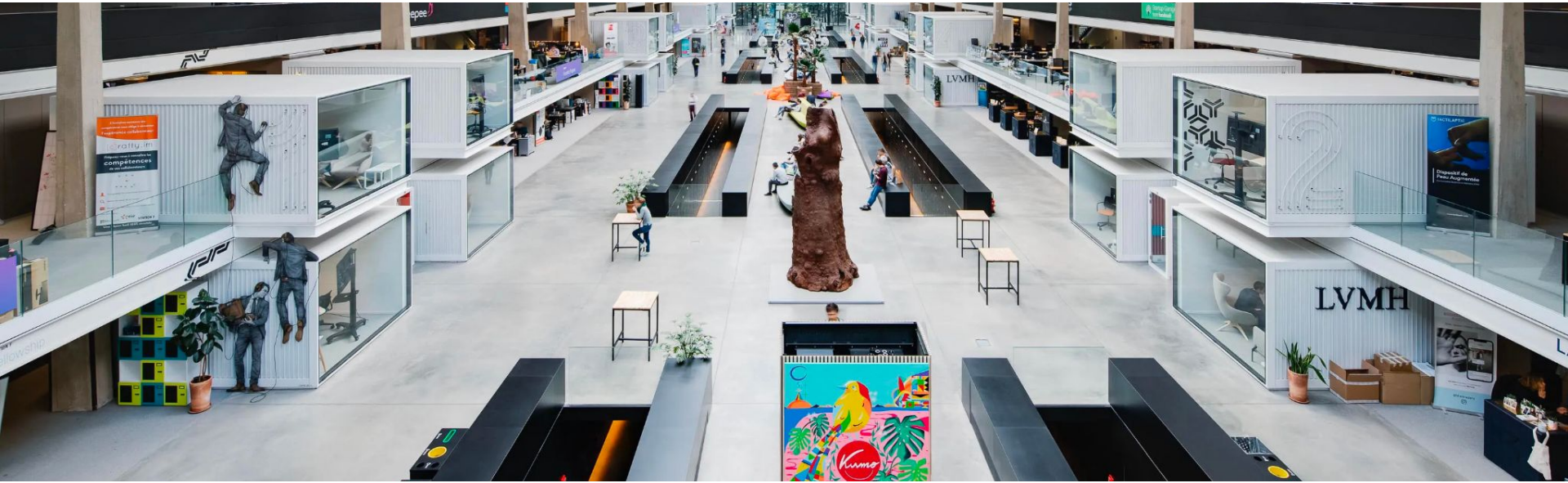
Challenges :

During its daily operations, Trendlines faces a few challenges :

- **Formation of an ecosystem**: establishing a complete ecosystem with all the necessary elements, such as government support, industry partnerships, research collaboration, and farmer involvement, is a challenge that requires concerted efforts and coordination.
- **Regulatory complexity**: the emergence of new technologies in the food industry brings forth the need for robust regulations. Collaborative efforts and information sharing are essential to develop and implement appropriate regulations that ensure safety, sustainability, and consumer trust.
- **Impact of fund structure**: the structure of investment funds presents challenges, particularly in long-horizon sectors like AgTech. Limited Partners, who provide capital, typically expect returns within a few years. This time frame can pose difficulties for investments that require longer-term development and growth.

Station F

Case study : a private incubator backed by a solo founder



Source : Station F website

Station F

Case study : a private incubator backed by a solo founder

France

Station F is an **innovation hub** located in Paris, France. It was founded by Xavier Niel with the aim of creating a ecosystem for startups and fostering **sustainable innovation**. Station F operates as a fully private company, offering a c**omprehensive range of programs and resources** to support the growth of over 1,000 startups and collaborates extensively with partners from various sectors, including corporates, universities, and public administrations.

Country-level context :

At the country level, France provides a **conducive environment for innovation and startup development**, characterized by **close collaborations** between public and private players. The government has implemented various measures to support entrepreneurs, including a range of **public financing offers** such as grants, guarantees, interest-free loans (*prêts d'honneur*), research grants, investments, export credit, and insurance. These initiatives are aimed at fostering innovation in **sectors that require extensive research**, where **time-to-market is typically longer**.

Entrepreneurs also benefit from the presence of public players like **BPI France** whose primary focus is to **support and finance French entrepreneurs**. It offers a comprehensive **suite of services that go beyond financial assistance**, including international advisory and technical assistance missions for foreign institutions involved in innovation development. This support infrastructure enhances the ecosystem for startups, providing them with **access to expertise, networks, and resources**.

France also offers **strong incentives for international entrepreneurs and startups** to establish a presence in the country. These incentives are designed to **attract global talent** and **foster a diverse and thriving startup landscape**. By creating an **attractive business environment**, France encourages international entrepreneurs to leverage the country's resources and opportunities for their ventures.

Genesis of the initiative :

Station F is a **fully private company** created in 2017 by Xavier Niel, a French entrepreneur who invested 250 million euros into the project in order to establish a **sustainable innovation ecosystem** capable of accommodating **1,000 startups**. This goal was achieved through the development of **30 distinct programs**, each accommodating an average of 15 to 30 startups, resulting in a vibrant community of 1,000 innovative ventures.

Recognizing the multifaceted needs of entrepreneurs, Station F sought to provide a **comprehensive offering**. To this end, it curated over **150 perks**, ensuring that entrepreneurs had access to essential resources and support. Additionally, Station F established **partnerships with 35 public administrations**, facilitating streamlined interactions between startups and relevant governmental bodies.

Furthermore, Station F positioned itself as a **hub of knowledge exchange and networking opportunities**. It orchestrated an impressive array of 600 events annually, ranging from workshops to conferences, providing entrepreneurs with avenues to learn, connect, and grow their networks.

Station F

Case study : a private incubator backed by a solo founder

France

Ecosystem interactions :

Station F has fostered a **huge community of entrepreneurs, experts, mentors, corporates, universities, and innovation structures** from around the world. From the outset, partnerships were recognized as critically important to create a strong community centered around innovation and to leverage expertise from various fields. Partnerships were created with corporates, universities, and independent structures:

- **Corporates** offer accelerator programs tailored to their specific needs within Station F. Additionally, the **Business Club serves as a gateway for corporations** seeking to engage with the campus without having a dedicated program. It targets innovation departments of major groups, facilitating knowledge exchange on best practices for collaboration with startups and establishing connections with Station F startups.
- **Universities** play a important role in the Station F ecosystem, both through accelerator programs and by linking research activities with entrepreneurial initiatives.
- **Independent structures** (incubators, accelerators, and innovation programs) allow Station F to expand its reach and make the entire ecosystem benefit from the browder network, such as:
  - HECTAR, an AgTech accelerator with a pilot farm in regenerative agriculture, offers a wide range of resources, including coworking spaces and seminars.
  - Shakeup Factory, an AgTech accelerator, collaborates with numerous AgTech players like EIT Food, amplifying the impact and opportunities available to startups within the Station F network.

The **close relationships between Station F and the government** provide an opportunity for entrepreneurs to **express their needs**, with frequent interactions ensuring their perspectives are considered. Moreover, **public services**, such as FrenchTech and the postal office, maintain a presence at Station F, further enriching the support ecosystem.

Actors involved :

Public actors:

LA POSTE

La FRENCH TECH

Academia:

HEC PARIS

ESSEC BUSINESS SCHOOL

CentraleSupélec

Corporates:

Google

Microsoft

Independent structures:

ENTREPRENEUR FIRST

HECTAR

AgTech accelerator

SHAKEUP FACTORY

AgTech accelerator

Non exhaustive list

Station F

Case study : a private incubator backed by a solo founder

France

Operations :

Station F operates as a **community of innovation**, providing a **physical space and coaching program** for entrepreneurs. It fosters collaboration and growth, even offering a **coliving space** called Flatmates to accommodate non-Parisian entrepreneurs.

Station F hosts a total of **30 programs**, with three managed directly by Station F and the rest by corporates, universities, and independent structures. This variety poses a **governance challenge**, requiring coordination among Station F staff, program managers, entrepreneurs, and other partners involved.

The French **ecosystem's legal framework** plays a significant role in **facilitating innovation** at Station F, with public funding and open discussions with innovation players.

While international expansion is not currently planned, Station F actively considers ways to **share its accumulated knowledge and expertise** with other structures and countries; Station F also **invests** in startups through initiatives like Future 40 and the Founders' program to support the growth and success of the startups within its community.

Teams :

Hiring individuals who possess the **right mindset** and fit within Station F's **culture** is crucial. By assembling a talented team, Station F creates an environment that fosters innovation and success for startups.

To manage its operations effectively, Station F has a dedicated team of **45 staff members**. Roxanne Varza, named as the Director by Xavier Niel, provides strategic leadership. Station F staff is composed of teams in partnerships, business development, operations, building maintenance, and communication. These teams collaborate to ensure smooth functioning and support for startups. The partnerships team fosters collaborations, while the business development team expands the network and attracts resources. The operations and building maintenance teams manage the physical space, and the communication team promotes Station F's activities.

Perspectives :

- **Partnerships** play a critical role in the growth of the AgTech sector, facilitating the exchange of information, collaboration, and synergies needed to build scalable solutions. A Pan European network would greatly benefit the AgTech sector by fostering connectivity and knowledge sharing.
- **Public support** is vital in terms of **financing** and creating a **favorable business environment**, simplifying processes such as company formation, hiring, investing, and innovation protection. This support enables entrepreneurs to navigate the challenges associated with the AgTech sector more effectively.
- **Specialized players** such as AgTech investment funds and accelerators, like Big Idea Ventures, bring valuable expertise and understanding of the sector's unique challenges. Their support is essential in providing relevant assistance to AgTech entrepreneurs and fostering sector-specific innovation.
- Given the nature of innovations in AgTech, **research** plays a crucial role. It is **important for research to align with market needs and collaborate with other ecosystem players** to develop solutions that meet real-world demands.

Station F

Case study : a private incubator backed by a solo founder

France

Financing :

The founder and financier of Station F does not prioritize a return on investment (ROI), but instead emphasizes the importance of **long-term financial sustainability**.

The organization operates with a business model centered around generating revenues and managing costs effectively.

- Station F **generates revenue through various channels**, including space rentals for programs, startups, public players, stores, and events. Programs and startups pay for a **comprehensive package** that includes **access and services**.
- To support its operations, Station F incurs costs in the following areas: human resources, services, and real estate.

Investment :

Station F is 100% privately-financed initiative launched by **Xavier Niel**, a **French entrepreneur and business angel**, who made an initial investment of 250 million euros. However, since then, Station F has not received any additional investments and must strive to **become financially viable** on its own.

In November 2022, during the unveiling of the 2022 edition of **Future 40**, the 40 most promising companies on campus, Station F announced its **investment** for the first time in some startups part of this year's Future 40. Investments have not yet been disclosed.

Success story :

- One notable success story at Station F is the creation of **Future 40**, a community consisting of 40 startups carefully selected each year among the campus due to their exceptional potential.
- Another achievement is the development of **Launch**, an online platform designed to support aspiring entrepreneurs. Launch offers **comprehensive resources on entrepreneurship** such as training modules, exercises, and a vibrant community to help individuals kickstart and mature their projects so that they reach a maturity level that could allow them to apply for one of Station F's programs.
- Several startups from Station F have achieved significant success in recent years. Notable examples include the FinTech company **Fintecture**, which raised 24 million euros in 2021, demonstrating strong investor interest in their innovative solutions. **PlayPlay**, a prominent player in the video creation space, secured an impressive funding of 47 million euros in 2022, further fueling its growth and market presence. The AssurTech startup **Seyna** also made waves, raising 33 million euros in 2022, validating the demand for their disruptive solutions in the insurance industry.

Station F

Case study : a private incubator backed by a solo founder

France

Best practices :

- To be effective in supporting entrepreneurs and fostering a relevant ecosystem, it is crucial to **understand their needs**. Station F has gained valuable insights by **actively engaging with entrepreneurs**, **listening to their requests**, and **adapting its offerings accordingly:** 2 to 5 new programs are launched every year to fit evolution of market needs.
- Staying **up to date with new innovative trends** is essential to ensure that the services and programs provided by Station F remain relevant and innovative. This involves **continuous research, market analysis, and staying connected** with the latest developments in the startup ecosystem.
- Partnering with **research institutions** is a best practice embraced by Station F. For instance, **Shakeup Factory collaborates with EIT Food**, granting **access to a wide range of R&D centers** across Europe. This partnership enables startups to tap into **cutting-edge research** and **leverage scientific expertise** to drive AgTech innovation.
- **Community building and forming coalitions** are recognized as key enablers of AgTech innovation. By fostering a **strong community of startups, experts, and mentors**, Station F creates an environment **conducive to collaboration, knowledge sharing, and collective problem-solving**. Additionally, **engaging with policy and regulatory frameworks, securing financing for transformative changes, and establishing data definitions and standards** contribute to the growth and success of AgTech innovation.

Challenges :

- The launch of new programs each year requires **continuous monitoring and adaptation** to **meet the evolving needs** of startups and ensure that Station F offer is always **in line with emerging innovation trends**.
- The previous aspect is even more important considering that **entrepreneurs become increasingly international** in their outlook, and the emphasis on national boundaries is reduced, making foreign incubators such as YCombinator, a renowned startup accelerator, poses strong competition for Station F. Startups are now focused on **global opportunities**, making it important for Station F to differentiate itself and offer unique value propositions to attract and retain talent.
- Unlike some sectors that are concentrated in specific regions, **AgTech is spread across the country**. This decentralized nature poses challenges in terms of **coordination, networking, and building a cohesive ecosystem**.
- The **involvement of public actors** is essential in the entrepreneurial ecosystem, but it also presents challenges. Interactions with public players can involve **complex bureaucratic processes** and require effective communication to **align goals** and ensure the ecosystem's development and growth.
- The AgTech industry has seen limited true innovation in the way food is grown, packaged, and sold, in the last 50 years. With few significant advancements in processes, there is a **need for disruptive innovation** to drive transformative changes.

Food Tech Valley Dubai

Case study : a government backed regional initiative

Source : Gulf Business

Food Tech Valley Dubai

Case study : a government backed regional initiative

United Arab Emirates

The Food Tech Valley is a UAE led **government initiative** designed to **address food security** locally, regionally and globally by uniting the complete food and agriculture ecosystem in one physical place : Dubai. It was created to reimagine the potential of food, make the local food clean, support businesses and provide world class services and infrastructures for AgTech companies.

Country-level context :

The UAE is **centrally located** between Asia, Europe and Africa and has hence become a hub for businesses due to the access to capital (many VC firms and angel investors are present), the other incentives such as a very efficient healthcare system and a thriving ecosystem with many networking events and programs.

Dubai has also established itself as **a stable place in terms of legal and regulatory infrastructure**. Companies can easily do business and start their branches there.

Agriculture in the UAE is a challenging sector as there are only **5% of arable lands** due to the difficult climate conditions. Indeed, UAE has an arid climate characterised by high temperatures, low rainfall, lack of natural waterways and poor soil. Cultivable areas are around 160,000 hectares and most of which is taken up by date palms. **90% of the food is imported** representing $400b by 2025 according to a recent study.

One major obstacle faced by the industry of agriculture in the UAE is the **scarcity of water reserves** hence the recent shift towards modern irrigation systems to replace the traditional flood irrigation, to reduce water consumption.

To face these challenges, AgTech has hence taken more and more place within the country.

Genesis of the initiative :

The Food Tech Valley Dubai was launched by Sheikh Mohammed bin Rashid Al Maktoum, Vice President, Prime Minister and Ruler of Dubai with a view to **creating a sustainable approach to food production** in the UAE.

The project was launched as there are **strategic implications in line with the UAE Food Security National Strategy 2051** :

- Food security : there is an increase in demand due to the massive regional market size (300M)
- Economic diversification : contribution of agricultural production to GDP is now only 0,1% in Dubai
- Employment : open a different field of employment / favor talent development in the UAE

The government decided to fund this huge project and the first phase of the Food Tech Valley was **launched in 2021** in partnership between the Ministry of Food and Water Security and Wasl Properties.

Food Tech Valley Dubai

Case study : a government backed regional initiative

United Arab Emirates

Ecosystem interactions :

Once the Food Tech Valley is ready, it aims to **involve all stakeholders from the Ag and Food ecosystem** throughout the whole value chain :

- Farmers & Producers
- Startups & SMEs
- Corporates
- Incubators & Accelerators
- Government & NGOs
- Financial institutions & Investors
- Academia
- International Organisations
- Associations & councils
- Consultancy & advisory

It has already developed **partnerships**, such as PepsiCo and their greenhouse accelerator program, financial entities to support businesses (Free Zone Authority), the Lab of Dubai Municipality to provide all after-production research and lab reports, Emirates University to link corporates and academic research.

In addition to these various partners, the Food Tech Valley has structured a clear **governance structure** involving multiple public actors :

- Government of Dubai : funder
- Wasl : the real estate arm of the government, private company fully owned by the government
- Ministry of Climate Change and Environment : partner of Wasl on this project
- Ministry of Finance : chairman of Wasl

Actors involved :

Main stakeholder :

حكومة دبي
GOVERNMENT OF DUBAI

Operational partners :

وصل wasl

UNITED ARAB EMIRATES
MINISTRY OF CLIMATE CHANGE
& ENVIRONMENT

Other stakeholders involved :

UNITED ARAB EMIRATES
MINISTRY OF FINANCE

بلدية دبي
DUBAI MUNICIPALITY

UAEU

Non exhaustive list

Food Tech Valley Dubai

Case study : a government backed regional initiative

United Arab Emirates

Operations :

The Food Tech Valley is a hub focused on **AgTech and FoodTech** that will involve **activities that cover the whole value chain** : food pre-production, food production, food trading, food processing, food packaging, food logistics, food distribution, food surplus & waste management.

The focus is to **support and attract new agricultural technologies**, bridging global and local knowledge in the field, while establishing a **collaborative network** to lead regional transformation and export knowledge toward sustainable food system.

Legal framework :

The Dubai government has implemented several **business-friendly policies and initiatives** that are attractive for startups especially due to the presence of **free zones** in the country :

- Tax exemptions
- Streamlined business registration processes
- Authorisation to create a business owned by foreign entities and expatriates instead of leaving 51% to a local partner (exact % is to be defined on a case by case basis)
- Creation of new types of visas (e.g. Golden Visa, five-year visa for exceptional students and entrepreneurs)
- ...

Perspectives :

- While the Food Tech Valley is still under construction, it has a vision to become the **hub for future clean tech-based food and agricultural products** in Dubai and UAE in general.
- The Food tech Valley is aimed at **tripling Dubai's production of food** to tackle the challenge of food security in the country.
- Food Tech Valley plans to build a **B2B marketplace powered by Tradeling** to help support, connect, and match buyers from various industries, including hospitality, which is host to food and beverage sellers that obtain quality products and raw ingredients from local and international suppliers. This agreement will provide a **digitalized trading experience** that will benefit food producers by assisting them in developing their companies in the UAE. Local producers will benefit from Tradeling's platform by boosting their growth. Credit financing options will also be provided, including flexible payments for SMEs and start-ups.

Food Tech Valley Dubai

Case study : a government backed regional initiative

United Arab Emirates

Financing :

The business model of the Food Tech Valley is based on renting the different places to corporates, startup programs etc.

As it is still under construction, more information on the model will be provided at a later stage.

The Food Tech Valley however currently has the resources to welcome early stage startups by providing a bridge with corporates.

Investment :

The Food Tech Valley is a project **fully funded by the government** of Dubai.

GOVERNMENT OF DUBAI

Success story :

PEPSICO GREENHOUSE COLLABORATIVE ACCELERATOR

The Greenhouse Accelerator Program is **a PepsiCo initiative** to accelerate sustainable, breakthrough innovations. The collaborative accelerator program is designed to **nurture the growth of emerging and sustainable brands in the food and beverage sector** by identifying breakthrough startups that will receive funds and partner with PepsiCo experts to help grow their businesses.

The accelerator provides startups with **grants** to support operations and help launch or scale their innovation but also access to **mentors and experts** to provide guidance across all aspects of business development and access to **business opportunities** through PepsiCo's business development team.

Since 2017, PepsiCo Greenhouse Accelerators have included 50 companies and over 90 mentors **across multiple continents** and focus areas and has now partnered with the Food Tech Valley Dubai for collaboration in the **MENA region**.

Food Tech Valley Dubai

Case study : a government backed regional initiative

United Arab Emirates

Best practices :

- The Food Tech Valley is structured around 3 main pillars creating **a full and central ecosystem** with all the services and players needed for all players to grow :
  - A physical space
  - An ecosystem program
  - A one stop shop services for all these companies providing anything needed for any company to establish the business or to work in Dubai
- By involving all players of the AgTech and FoodTech ecosystems, the Food Tech Valley is playing **a role of catalyst**
- The Food Tech Valley's **value proposition** has been well defined to face competition from other hubs around the world :
  - Central location and easy access to markets in Asia, Africa and Europe
  - Access to a regional market size of 300M people
  - Stable legal and regulatory infrastructure
  - Availability of affordable facilities and manpower
  - One of the largest trading and logistics hubs in the world

Challenges :

- The Food Tech Valley is a huge and ambitious **real estate project** that involves **considerable investments** and would have been difficult to create if it was not backed by the government
- The governance around a public initiative can sometimes be a challenge in terms of decision making processes as it involved committees with members from the Ministry of Climate Change and the Environment, Dubai municipalities, the Wasl group and other entities from the government

Cropin Technology

Case study : an AgTech startup

Source : Cropin website

Cropin Technology

Case study : an AgTech startup

India

CropIn is an Indian company developing **software-as-a-service** for agriculture enterprises to **drive efficiency in farming operations**. They act as a **global intelligence provider** offering suite of products to various stakeholders in the agri-ecosystem.

Country-level context :

India has a unique agricultural landscape with approximately **120 million farmers,** predominantly smallholders with landholdings of less than 2 hectares. The country encompasses **diverse agro-climatic zones**, providing the opportunity for farmers to cultivate a wide range of crops. The key challenge in the Indian agricultural sector is the need for increased productivity, aiming to **achieve more with fewer resources**, reduce production costs, and improve farmers' income.

The public sector has demonstrated a strong focus on **integrating digital and AI technologies into agriculture**, promoting the use of technology to improve farming practices. Government schemes and **subsidies** have been implemented to support these initiatives. The digitization of the telecom sector has also contributed to the **lower cost of technology adoption**, enabling easier exchange and sharing of agricultural information among stakeholders.

However, the AgTech sector in India also faces significant risks. **Climate change** poses challenges for businesses and farmers, leading to increased production costs and risks associated with natural disasters and diseases. Additionally, the costs of agricultural inputs have risen faster than the prices of final outputs, impacting profitability for farmers. This disparity between production costs and market prices makes it difficult for the younger generation to enter and sustainably engage in agriculture. To address these challenges, there is a need to focus on increasing agricultural productivity and making **farming more financially rewarding** for producers, thereby ensuring the sector's long-term sustainability.

Genesis of the initiative :

Founded in **2010** by Krishna Kumar (CEO) and Kunal Prasad (COO), Cropin is a Indian startup based in Bangalore with offices in New Delhi and Amsterdam.

They work on a B2B approach with various types of customers. One key problem they sought to solve was the lack of technology adoption in the agricultural field, which resulted in **inefficiencies and disconnected information across the value chain**. This led to issues such as the spread of diseases, suboptimal production levels, and limited access to market prices for farmers.

Cropin aimed to bridge these gaps by providing a scalable tech solution that could **connect and incentivize all actors in the agricultural ecosystem** to work together. Rather than working directly with individual farmers, Cropin focused on establishing partnerships and scaling their services to have a broader impact, by collaborating with various stakeholders, including public and private entities, industries, institutions, and development bodies.

Ecosystem interactions :

Cropin has partnered with **over 250+ organizations globally**, fostering collaboration and partnerships to address the challenges and opportunities in the sector :

- **Private companies** : Cropin works with different value chain actors, including agribusiness corporates, input companies, providing seeds and working alongside farmers, insurance and financial companies to offer insurance solutions to farmers and facilitate access to finance for smallholder farmers.
- **Public actors** : Cropin collaborates with government entities, including the Government of India, which has implemented programs like the crop insurance program. Their solutions have been embedded in government initiatives related to climate-smart agriculture, capacity building training, and women empowerment. The government's interest in new innovations and startups has created opportunities for partnerships. Cropin benefits from strategic collaborations with the government, participating in a request-for-proposal process. The government's support, evident in programs and initiatives, facilitates the scale-up and adoption of Cropin's solutions.
- **International agencies:** Cropin establishes technology partnerships with agencies from Europe and the United States, such as the European Space Agency, to leverage data and expertise. These collaborations involve sharing technical knowledge, data, and insights to drive innovation in areas like sustainability and carbon management.
- **Academia & Research centers** : Cropin forms research partnerships with academia and research institutes to explore specific use cases and leverage specialized expertise.
- **Startups** : By collaborating with complementary startups and combining their respective strengths, they aim to provide a more holistic solution that addresses the diverse needs of farmers
- **Consultants & Advisors** : To protect their intellectual property, they have engaged consultants and advisors who have assisted them in the patenting process

Actors involved :

Corporates :

pepsi

Solnovation

Governments :

WORLD BANK GROUP

सत्यमेव जयते
Government of India

Academia :

esa
European Space Agency

Startups :

HEAVEN SPROUT FOODS

Non exhaustive list

Operations :

Cropin has a structured organization with approximately **175 team members** across their different locations around the world. In terms of **governance**, their board consists of founders and directors who represent the industry, as well as investors and experts who serve as advisors. This strong board composition ensures strategic guidance and expertise.

Cropin offers a comprehensive suite of solutions that cater to different aspects of agriculture and supply chain management :

1) **Cropin Grow**: This solution focuses on the production side of agriculture, providing farmers with tools and insights to optimize crop growth and increase productivity.
2) **Cropin Connect**: It is a farmer app that enables direct engagement with farmers, providing features such as weather advisories and other relevant information.
3) **Cropin Trace**: This solution offers end-to-end traceability throughout the supply chain, ensuring transparency and accountability. It also provides traceability to end customers, enhancing trust and quality assurance.
4) **Smart Trace**: This component utilizes artificial intelligence and satellite data to deliver crop-level risk assessment and advisory services at a regional level. It helps in early disease detection and offers actionable insights for better crop management.

Access to data :

Cropin has developed mechanisms to facilitate the collection and utilization of data through **two main sources** :

- **From their customers** : data is inputted by the client company into their cloud platform, allowing for **seamless integration** of both old and new data and enabling the generation of valuable insights and intelligence instantly
- **From their local teams :** Cropin leverages a combination of public sources and their own dedicated teams and partners on the ground for data collection and validation, ensuring a comprehensive and reliable data ecosystem to support their activities.

They also have a strong knowledge on the data regulations around the world, allowing them to have a competitive advantage as they are able to **assist their customers in being data compliant** in their respective countries.

Perspectives :

Their goal for the next five years is to continue building the next level of technology that helps agriculture become more productive and prescriptive. They aim to leverage disruptive technologies like AI to **address future challenges in agriculture and drive positive transformation** in the industry.
Cropin has a global presence, operating in over 90 countries. Their platform is designed with a robust architecture that can accommodate a wide range of crops, currently supporting more than 1000 types of crops. This scalable architecture enables them to **expand into various cities, regions, and countries** as they continue to grow and serve the needs of farmers worldwide.

Cropin Technology

Case study : an AgTech startup

India

Financing :

Cropin operates on a **subscription-based** business model, with an **annual licensing model** that is typically structured for a **three-year period**, but can be renewed annually. They offer a Software-as-a-Service (SaaS) solution, which provides several advantages for their customers. The SaaS model enables rapid deployment of the solution at scale, granting customers access to cutting-edge technology and industry learnings.

One of the key benefits of the **SaaS** model is the ability to incorporate learnings quickly into the program. Additionally, the **long-term** nature of the SaaS model provides customers with greater value compared to short-term solutions, making it a cost-effective choice for them.

Cropin also offers **discounts based on the scale of the subscription**, further incentivizing customers to embrace the SaaS model and benefit from its advantages.

Investment :

Cropin has secured funding from **impact investors, venture capitalists,** and various **development agencies**, including the World Bank. They have also received awards and **grants** from government programs to support their growth and initiatives.

In terms of numbers, there has been an $8 million investment (Series B), $20 million investment (Series C) and $14 million investment in Series D from actors including :

IMPACTASSETS
INVEST WITH MEANING

chiratae
VENTURES

abc
WORLD
ASIA

JSR Corporation

Pratithi
INVESTMENTS

CDC
Investment works

BILL & MELINDA
GATES foundation

Success story :

The startup Cropin has achieved remarkable success in its endeavors since it was launched :

- They have digitized a vast expanse of **16 million acres** of farmland, positively impacting the livelihoods of over **7 million farmers**.
- With their extensive crop knowledge graph, they have curated information on more than **500 crops** and over 10,000 crop varieties, spanning across **92 countries.**
- Their **predictive intelligence solutions** have been applied to enhance agricultural practices and optimize over 0.2 billion acres of farmlands worldwide.

Best practices :

- **Building the right product:** Cropin emphasizes the importance of developing a product that addresses the specific needs and challenges faced by farmers. Their focus on understanding the problems on the ground allows them to tailor their solutions effectively.
- **Building the right team**: Hiring and nurturing the right talent is crucial for Cropin. They recognize the challenges in finding skilled individuals and invest in creating a culture that keeps the team motivated and focused on their vision. They also leverage their industry connections and research partners to source talent.
- **Building the right partnerships**: Cropin believes in working closely with partners to achieve their goals. By forging strategic partnerships, they are able to access the necessary resources, expertise, and data to enhance their offerings. This collaborative approach ensures a bottom-up problem-solving approach.
- **Continuous learning and improvement:** Cropin acknowledges that the agriculture industry has its own learning curve. They invest time, network, and resources to gather the right data, establish effective structures, and form partnerships. They learn from their experiences and continuously improve their operations.

Challenges :

- **Lack of emphasis on fundraising support:** Cropin highlights the need for greater emphasis on fundraising support within incubation centers. While training and advisory services are valuable, Cropin believes that the primary focus should be on facilitating startups in securing necessary funding for growth and scalability. The current support landscape falls short in this aspect even though there is good assistance on knowledge exchange and advisory services.
- **Intense competition among startups:** The agtech industry in India is witnessing a surge in startups, with over 1000+ players vying for market share. This intensifies the competitive landscape for Cropin. To thrive amidst this crowded market, Cropin must differentiate itself and continuously innovate to maintain a competitive edge.
- **Seeking opportunities in India's startup ecosystem**: Despite the challenges, Cropin acknowledges the ample opportunities within India's vibrant startup ecosystem. The presence of numerous venture capital firms (VCs) and incubators provides promising prospects for partnerships and growth. By leveraging these opportunities, Cropin can navigate the challenges and forge strategic alliances.

Plug & Play Tech Center

Case study : a private innovation platform backed by large corporates

Source : Techonomy

PLUG AND PLAY BRAZIL

Plug & Play Tech Center

Case study : a private innovation platform backed by large corporates

Brazil

Plug & Play Brazil is **an innovation platform** that operates within the **Latin American market.** As an integral part of the Plug & Play global network, Plug & Play Brazil focuses on **fostering sustainable and inclusive economic development in the region.** Plug & Play Brazil collaborates closely with local partners, universities, research centers, and other stakeholders to drive innovation and support the growth of emerging startups.

Country-level context :

Brazil's agricultural sector is a significant contributor to the country's economy. The agricultural industry accounts for approximately **25% of Brazil's GDP**, making it a vital economic driver and employing over **15% of the country's workforce :**

- Consumer trends are primarily driven by supply chain considerations rather than individual demands for quality. Therefore, issues related to the supply chain, such as traceability, hold significant importance.
- The priority is to ensure **food security** and meet the challenge of feeding the population, as **affordability is the main issue for consumers.**
- The sector witnesses major trends in data analytics, ingredient innovations, manufacturing, biotechnologies, supply chain management, and packaging.

Specificities of Brazil in terms of agriculture:

- **Cooperatives** play a vital role in connecting with local producers and serve as an important **road to the market**, considering that the ecosystem is highly **fragmented** with many independent farmers having limited connectivity on one side, and **commercial farmers** with critical mass on the other side, therefore requiring different approaches for technology adoption;
- Politicians are involved in cooperatives and connected to mayors, fostering discussions about innovative approaches and exhibiting low corruption levels.

Genesis of the initiative :

Plug & Play is a global innovation platform originating from Silicon Valley, present today in **more than 50 locations.** They work on **20+ verticals; among them 4 are linked to agtech** (food & beverage, animal health, agtech, sustainability very linked/correlated).

- In 2014, they entered the Latin American market as investors, and in 2019, they established a management entity in Sao Paulo, Brazil.
- Prior to the official launch, Plug & Play Brazil spent three years actively engaging online, immersing themselves in the local ecosystem, forging connections with universities, research centers, and actively participating in events.

Plug&Play helps big corporations (that possess distinct innovation cultures, diverse approaches to innovation, and different business models) **by supporting their innovation strategies and boosting their innovation agenda.** This collaboration allows corporations to explore different verticals, discover new geographies, and expand their presence worldwide across various areas of knowledge.

Plug&Play has successfully connected over **550 corporates** to more than **150,000 startups**, with an annual acceleration of **240 startups** and **200 investments**, resulting in an impressive portfolio that includes **31 unicorns.**

Plug & Play Tech Center

Case study : a private innovation platform backed by large corporates

Ecosystem interactions :

Plug & Play Brazil actively engages in **non-financial partnerships** with governments, public institutions, and foundations to **facilitate information exchange**, benefiting both parties. It provides valuable insights into specific regulatory environments and research conducted within the country.

An undisclosed partnership with a state governor has three significant outcomes :

- **Inspire and accelerate founders from the State**, providing necessary resources and support;
- Plug & Play Brazil brings startups from other locations to **enhance public services, fostering innovation**;
- **Establish a bioenergy hub**, generating high-value job opportunities and attracting investments to the State.

In addition to government partnerships, Plug & Play Brazil forms client partnerships with private corporates, facilitating contracts and connections for startups without charging them. To ensure the successful implementation of these initiatives, Plug & Play Brazil recognizes the importance of having a **supportive institutional ecosystem**.

By partnering with authorities and organizations that specialize in relevant topics, Plug & Play Brazil ensures **alignment and collaboration within the ecosystem :**

- In Brazil, Plug & Play operates within an agricultural hub situated in the heart of a soybean center.
- Working closely with Embrapa, a government-owned company, Plug & Play actively engages in understanding the local dynamics and identifies areas for improvement in the agricultural sector.

Creating density within the ecosystem is paramount. In-person events provide a platform for networking, collaboration, and knowledge sharing among stakeholders of the ecosystem.

Actors involved :

Corporates :

Public actors :

Start-ups :

Plug & Play Tech Center

Case study : a private innovation platform backed by large corporates

Operations :

Plug & Play operates a comprehensive system to **match startups with corporates, exchanging with over 15,000 startups annually.** Their team evaluates startups for technical and financial maturity, ensuring compatibility with big corporations and avoiding potential challenges from different ways of working. The selected startups align with the corporation's needs, and around 9,000 startups are on their waiting list).**They receive deal flow from VC, actively source startups, collaborate with government entities and universities, and participate in events.**

Companies approach Plug & Play with **different goals** :

- seek exposure to the global startup ecosystem;
- meet startups that impact their bottom line, addressing specific productivity targets or seeking external innovation;
- access trends in their industry and adjacent market;
- meet, confer, and build with industry counterparts.

Plug & Play facilitates **networking and knowledge-sharing among counterparts, shapes trends through reports and webinars, highlighting emerging topics.** They provide **tailored services** like startup databases, market trends, specific reports, and investment opportunities.

Ecosystem legal framework :

Brazil has established **a highly favorable legal framework for its ecosystem**, particularly in the agricultural sector.

The government demonstrates strong support for agriculture, creating an environment conducive to innovation and entrepreneurship.

Notably, three years ago, Brazil underwent a significant **legislative transformation** by implementing legal support and a regulatory framework specifically designed to benefit foreign startups. This change aimed to mitigate labor risks for investors and encourage agricultural innovation to thrive. The ecosystem in Brazil is primed for the growth and development of innovative solutions in the agricultural sector, further reinforcing the welcoming stance towards advancements in the industry.

Perspectives :

Farmers in Brazil are organized in different ways, including cooperatives and independent farmers, requiring diverse approaches to reach them and provide them with innovative solutions. Innovations that enable farmers to **access and utilize data** play a crucial role. Addressing environmental challenges can also lead to social problems, necessitating innovative solutions that address both aspects. **Collaboration among all stakeholders is key to building a robust agtech ecosystem.** Big corporations have a vested interest in innovation and interacting with startups, as startups can collaborate with or sell their innovations and services to them.

It is important to develop other sectors linked to AgTech, such as logistics and supply chain, to support the growth of AgTech ecosystems.

Plug & Play Tech Center

Case study : a private innovation platform backed by large corporates

Financing :

- Plug & Play is hired by corporations or governments to **scout, select, and prepare startups** on their behalf, serving as a link between startups and established entities.
- Their **services are completely free for founders**, with no fees or equity taken from startups.
- When a startup reaches a stage of **potential collaboration with a big corporation**, Plug & Play may choose to invest in them**,** demonstrating their confidence and commitment to supporting the startup's growth.
- In addition to direct investments, Plug & Play engages in **co-investment opportunities with leading venture capital investors globally**, providing startups with access to a broader network of funding and expertise.
- **Startups can be listed in the Plug & Play database at no cost,** while corporates pay a fee based on their specific needs, market trends, and annual membership allocation. This ensures corporates gain access to relevant and promising startups in their industries.
- **Plug & Play offers trend reports for purchase by corporations.**

Investment :

Plug & Play invested in **more than 1,600 startups**, including notable companies like **PayPal, N26,** and **Dropbox**, through **6 investment vehicles.** They invest in startups during the early stages, providing funding ranging from seed to pre-Series A rounds. Their main fund, Plug & Play Ventures, invest across various industries worldwide. They prioritize startups with **strong traction and the potential to become international leaders**. Additionally, Plug & Play manages funds that are open to external investors, focusing on specific themes such as supply chain, retail, sustainable development, financial services, and smart cities. They also have generalist funds dedicated to continuing their investment efforts.

Sao Paulo portfolio extract : valora, yattó logística reversa, RECIRCULAPP, PURO BIOPLASTICS, musa, GreenBricks, SÍCLO RURAL

Success story :

tridon ARABLE

The story of Tridon & Arable highlights the collaboration between Tridon, a Brazilian investment firm, and Arable, an agricultural data and analytics startup. Tridon sought an experienced partner to create a solid portfolio in sustainable agriculture and joined Plug and Play's innovation hub. **Through extensive search and engagement with startups, Tridon identified Arable as a potential match, despite initial differences in industry focus. They recognized the opportunity to help Arable penetrate new markets like Brazil. After a series of meetings and discussions, Tridon's board approved the investment, driven by shared values, growth potential, and simplicity in the collaboration process.** The success of this partnership demonstrates the power of open innovation in driving inspiration and innovation for business success.

Plug & Play Tech Center

Case study : a private innovation platform backed by large corporates

Best practices :

- **Create a culture of innovation:** Plug&Play fosters a culture of innovation within large groups by instilling an environment that values and encourages creativity, risk-taking, and continuous learning.
- **Guide large groups through the innovation process**
- **Ensure full commitment from major groups:** it is crucial to ensure that major groups are fully committed to the innovation program, aligning their objectives and resources to drive successful collaborations with startups.
- **Startup alignment with current needs:** Plug&Play ensures that startups truly meet the current needs of major groups, facilitating partnerships where startups can adapt their innovations to the specific requirements and challenges faced by these large groups.
- **Thoughtful adaptation for global scalability:** as part of the Plug&Play platform, startups presented to other offices should be able to adapt their solutions to the needs and context of large groups in different countries, promoting global scalability and impact.
- **Balancing demands from large groups:** while it is important to address the needs of large groups, it is crucial to strike a balance to prevent excessive demands that could potentially divert startups from their original trajectory, avoiding the risk of turning them into consulting firms, or even killing them.

Challenges :

- **Lack of AgTech unicorns:** Brazil currently lacks AgTech unicorns, which presents a challenge in terms of showcasing successful local startups in the agricultural technology sector.
- **Focus on domestic market:** the majority of founders in Brazil believe that the domestic market is sufficient, potentially limiting their focus on expanding internationally and reaching global markets.
- **Limited international preparedness:** Brazilian entrepreneurs often lack the necessary international preparedness, including language proficiency in English and creating brand names that may not resonate in other languages, potentially hindering their global expansion efforts.
    - In contrast to Israel, where the absence of a large internal market has led to a focus on international expansion, Brazilian entrepreneurs may face challenges in adapting to the global market.
- **Potential future barriers:** decision-making by Brazilian entrepreneurs may inadvertently create barriers in the future, hindering scalability, adaptability, and international growth.
- **Difficulty in exporting solutions:** while Brazil has excellent AgTech solutions, exporting these solutions outside the country can be challenging, potentially due to barriers such as cultural differences, market entry requirements, and international business complexities.

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