Opportunities and challenges for the new generation of Sustainable AgTech startups in LAC

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Motivation

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- **The agri-food system** is changing due to demographic shifts, globalization, **sustainability demands**, food security concerns, and health awareness (FAO, 2018).
  - Food production **consumes** or affect abundant **natural resources**: land, soil, water, forests, and biodiversity (World Bank, 2020).
  - **LAC is a vital region for ecosystem services, as it is home to 57% of the world's primary forests and has extensive savannahs. These services include the production of 35% of the world's water and play an important role in mitigating climate change** (World Bank, 2020).
  - The **Region** produces **14% of world agricultural and food**, and **23% of global exports**; 25% by 2028(OECD/FAO, 2019).
- To **address sustainability challenges**, various technologies, such as **digital technologies and smart materials**, are becoming crucial in agri-food systems.

Hypotheses and objective

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I. The solutions and innovations of startups in the AgTech sector in LAC are contributing to the SDGs.
II. Startups are not fully aware of the SDGs, or do not know how to incorporate them into their value proposition or how to track their impact.
III. A greater awareness of environmental problems and social inclusion in AgTech ecosystems will contribute to improving the financing and development of startups aligned with the 2030 Agenda.

This research aims to identify key issues and obstacles, preventing sustainable AgTech startups from thriving and succeeding in the LAC region.

Data and Methodology

- **Data come from the Sustainable AgTech Challenge**, open in mid-2021
  - **115** companies/startups participated in the Challenge.
  - They were evaluated and ranked by a committee of experts
  - We did a **questionnaire** that covered the socioeconomic characteristics of the team, clients, finances, value proposition, environmental and social impact, and challenges for new ventures in AgTech.
- **Interviews with startups, stakeholders, experts, academics, and VCs**, etc., to gain insights and identify key factors driving/hindering AgTech startup growth.
- We used **traditional descriptive statistics and regression methods**
  - Since the Challenge **data is derived from a limited, non-random sample**, our results reflect only the companies that participated in the Challenge and **cannot be applied to the entire population of AgTech startups**.

Data and Methodology

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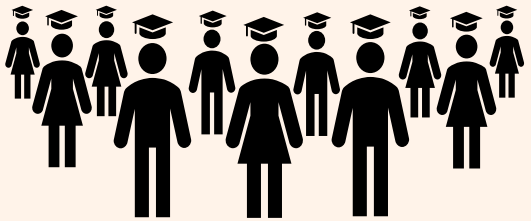
- The objective of our econometric analysis consist in **estimate the magnitude of the relationship between the startups' average score given by the jurors and a set of explanatory variables**, which includes socioeconomic variables, seniority, verticals, SDGs targeted, social inclusion, projected revenue, among others.
- **Our guiding idea is that jurors can be thinked as a representative sample of the stakeholders of the AgTech ecosystem whose comprehensive and multidimensional evaluation represents, in some way, a latent variable linked to their opinion about the growth possibilities of the startup.**
- Using OLS we model the expected value of startups' average score, in a linear way, conditional to a set of explanatory variables. In this sense, **we can measure how these variables "impact", on average on the startups'score**.

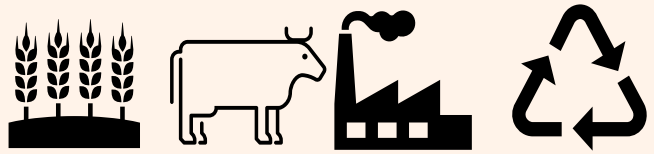
Main findings

Sociodemographic, geographic, and economic profiles of AgTech companies



- They are **young companies**, with teams that are made up of **highly educated people** and a remarkable **female participation**

- **The solutions they offer are located at the ends of the agrifood value chain: primary production, inputs for the industry, and waste disposal/recycling, not only at the end of the chain but throughout the entire chain.**



Main Findings

Environmental and social impact of AgTech sector

- **On average, of the eight SDGs surveyed in the questionnaire, companies report that their solutions contribute to four SDGs,** but some claims to contribute to as many as **eight** goals.

  1° Responsible Production and Consumption,

  2° Climate Action.

- **Regarding smart carbon technologies, the alternatives chosen were, Increase sustainable productivity, then Climate change mitigation and finally Climate adaptation and resilience.**

- However, **monitoring the environmental and social impacts of startups is still limited.**
- **Ninety percent of the companies points to social inclusion of vulnerable groups**, although they state some necessary conditions to achieve more inclusion

Regression results

Model	1	2	3
Explained variable	**Startup score (in log)**	**Startup score (in log)**	**Startup score (in log)**
% of women in the company	-0.235	-0.0674	-0.219
Average age of the team members			
Age 20-29 (base category)	-	-	-
Age 30-39	-0.0339	-0.0582	-0.215**
Age 40-49	0.265	0.226	0.00304
Age 50-59	0.143	0.272	-0.000574
Highest education level			
Bachelor's or equivalent (base category)	-	-	-
Doctorate or equivalent	-0.385**	-0.235	-
Master's or equivalent	-0.170	0.100	-
Lowest education level			
Bachelor's or equivalent (base category)	-	-	-
Master's or equivalent	0.0275	-	0.135
Primary education	0.215**	-	0.126
Secondary education	0.328**	-	0.547***
Tertiary education	0.399***	-	0.310**
Geographical location			
LAC (base category)	-	-	-
Rest of the world	0.159*	0.198**	0.151**
Vertical			
Proteins (base category)	-	-	-
Row crops	0.0318	0.0447	0.0708
Specialty crops	0.0165	0.0118	0.0612
Seniority of the company			
0-4 years (base category)	-	-	-
10 years or more	-0.154	-0.328**	-0.349*
5-9 years	-0.415**	-0.269*	-0.524***
SDGs			
Affordable and Clean Energy (base category)	-	-	-
Clean Water and Sanitation	-0.0148	-0.00174	0.0363
Climate Action	-0.0327	-0.0362	-0.0529
Gender Equality	-0.0258	-0.0204	-0.0446
Industry, Innovation, and Infrastructure	-0.0240	-0.00425	-0.0436
Life on Land	-0.0380	-0.0466*	-0.0594
Responsible Consumption and Production	0.0413*	0.0411	0.00977
Zero hunger	-0.0290	-0.0311*	-0.0433

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Regression results

Number of targeted SDGs	-0.0240	-0.00737	-0.0753***
Social inclusion (dummy)	0.345*	0.619***	0.500**
Social tracking (dummy)	0.0730	0.119	0.172*
Environmental tracking (dummy)	0.327**	0.0662	0.258
Barriers			
Access to capital (base category)	-	-	-
Access to human capital	0.00573	0.0331	0.0108
Access to markets	-0.00464	0.0239	-0.0209
Bureaucratic hurdles	0.00144	0.0397	0.0207
Connectivity	0.0715	0.0910	0.0828
Infrastructure	-0.0356	-0.0429	-0.00613
Lack of recognition for the entrepreneur as a role model	0.0234	-0.0557	0.0849
Low interaction between the scientific and business worlds	-0.0412	-0.0111	-0.0348
Other factors	-0.0794	-0.133*	-0.102
Tax burden	-0.0416	-0.0983	-0.0613
Ecosystem (dummy)	-0.0703	-0.156	-0.0259
Company's projected revenue			
0 USD - 499,999 USD (base category)	-	-	-
500,000 USD - 999,999 USD	0.453***	0.266**	0.238*
Constant	0.889***	0.583***	0.851***
Observations	488	488	488
R-squared	0.832	0.782	0.807

*** p-value<0.01, ** p-value<0.05, * p-value<0.1

Note: Since some variables can have more than one value for the same company, we pooled the information, i.e., from a statistical perspective, we treat a company with more than one response on a given variable as if it were several different companies. To account for this issue in the statistical inference, we clustered standard errors by companies.

Source: our own elaboration based on AgTech Challenge.

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Main Findings

Environmental and social impact of AgTech sector

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- Regression results show that **growth possibilities of this group of startups depend on their business model and profitability**, but also seems to be important the **tracking they make of their social and environmental impacts**.
  - ✓ Not only economic sustainability is important, **but also the social and environmental sustainability of the startups**.
  - ✓ Although the type of SDGs that startups target does not seem to be a determining factor in their growth possibilities, **it seems relevant that companies know well how their proposal contributes to the SDGs**.
  - ✓ **Youngest startups are the most promising**, in the sense that, on average, they seem to have greater growth possibilities than those with higher seniority.

Main Findings

Problems that hinder or prevent the mainstreaming of Sustainable AgTech

- **Access to capital is one of the most important obstacles facing by sustainable AgTech entrepreneurs in LAC**.
  - **from green funds**, when they lack certifications that accredit them as such, especially considering that the tracking of its impacts is still incipient.
  - **from venture capital**, because they do not know in depth the advantage of investing in sustainable ventures.
- **Market access is the next hurdle for green AgTech**
  - consumers are not fully aware of the **benefits of consuming sustainable** products, or they have **income restrictions**.
  - registration procedures for sustainable startups and their products differ across LAC countries.

Policy Recommendations

Raising the awareness of and incentivizing the tracking of SDG commitments

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I. **Raise farmers' awareness of climate change and training them in sustainability practices** through producers' organizations and gov't agricultural institutions.

II. **Train the agricultural producers to understand the dynamics of investment in sustainable startups**, and thus invest part of the surpluses of their main activity into such ventures.

III. **Provide tax benefits to agricultural producers who adopt sustainable practices.**

Policy Recommendations

Facilitating the flow of green investment to the sustainable AgTech sector

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I. **Increase the visibility of local startups in global green capital markets**, generating more value connections with investors and supporting startups in the process of obtaining international sustainability certifications.

II. **Foster green corporate investment in LAC by establishing and backing agencies and innovation hubs** that facilitate sustainable startups to collaborate with prominent companies in the agri-food industry.

III. **Enhance the expansion of green corporate investment through national fiscal policies.**

Policy Recommendations

Improving market access through consumer education and promoting trade services

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I. **Enhance sensibilization policies about the urgency of the climate change in LAC**. Current actions require more strength, scale, impact, or awareness needed to be fully considered part of the global climate change solution.
   - There is a **lack of technical knowledge and methodologies** to analyze, formulate and monitor development actions in terms of climate impact.

II. **Improve the connectivity of small rural producers,** so that they take advantage of multiple opportunities for sustainable production and generation of quality jobs, which have access to IoT as a necessary condition.

Policy Recommendations

Facilitating the science and business interface and reducing the cost of sustainable AgTech uptake

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I. **Generate spaces for connection and teamwork between green entrepreneurs and researchers**, to develop projects with a firm scientific-technological base and a strong approach to the market.
II. **Make accessible to startups the use of specific infrastructure**, such as laboratory and AI development spaces, equipment and connectivity, for the development of MVP.
III. **Promote financial inclusion policies that reduce the risk of the activities of small and medium farms**.

Policy Recommendations

Creating a supportive government environment

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I. **Establish service-oriented approaches for government administration** such E-Government and Single Windows.

II. **Reduce bureaucratic obstacles for startups to access national and international markets**, through reciprocal agreements inside each country and between countries that facilitate the registration procedures for sustainable startups and their products in the different LAC countries.

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Finally, we believe that **this study is a valuable conversation starter in LAC**.

The region still faces numerous economic and social problems that it will not be able to solve without a **significant leap in innovation**.

As the region is the world's leading net food exporter and given the urgency that climate change imposes, **LAC needs to transform its production structure into a sustainable one throughout the entire agri-food value chain**.

This requires the **commitment of their governments** but also a **strong involvement of the entire AgTech ecosystem**.

The region faces a huge challenge… but it also has a great opportunity.

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Thanks!

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