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SIZING UP THE AGTECH INVESTMENT BOOM THE LAST FRONTIER FOR DIGITAL PROGRESS



Investment in agriculture and the food industry is at a record high. Dealflow into companies looking to propel centuries-old techniques of farming food topped ~\$20 billion in 2018, up sixfold from 2012, according to agriculture-focused venture capital group AgFunder.

With the world running out of virgin arable land to farm, there is increasing pressure to find ways of getting more yield out of each acre of existing farmland. Innovators are sizing up data-driven software to optimize yields and develop AI-driven robots that can replace humans in the field.

Even amid the coronavirus pandemic, Agtech investments have continued at a breath-taking pace, with billions of dollars of new deals so far this year.

| WHAT IS AGTECH?

Agtech or Foodtech is the term used to describe companies that are seeking to address challenges faced by the food and agriculture industry by using modern technology. Many of these companies are developing IoT, sensors and software to improve crop farming movement, a trend that is often described as precision agriculture. But Agtech encompasses a broader spectrum of investments including improvements to animal protein industries, innovative agri-marketplaces and disruptions to other parts of the food value chain.

| WHY IS AGTECH SO IMPORTANT?

The world's population surged 90%, or by 3.3 billion in a four-decade period leading up to 2009, placing a strain on global food systems, according to the United Nations' Food & Agriculture Organization (FAO).

The global food industry is bracing itself for further population growth, as well as an increase in protein from continents such as Asia because of rapid economic growth. The challenge from the industry's perspective is managing to sustainably boost food production without degrading the world's remaining pristine areas. This requires boosting yield per hectare, through the use of modern technology and machinery.

Some of the pain points faced by modern agriculture:


- Farmers apprehensiveness to adopt new technology
- A third of food produced for human consumption is wasted or lost in the supply chain globally
- Up to a third of crops are lost due to pests and pathogens every year
- The world has lost a third of its arable land over three decades due to legacy agricultural practices
- Climate change is making traditional agriculture increasingly more unpredictable


BREAKING DOWN THE AGTECH TREND


Many companies arriving into the Agtech space are startups offering digital solutions to unlock a superior way of farming or processing food. But it also includes disrupting traditional market actors in the supply chain. Farming requires the use of synthetic fertilizers, GMO seeds and plant breeding techniques developed decades ago. The time for change is now, the startup community says.


The Agtech movement is not restricted to startups and venture capital, however. Big tech companies are entering the space, looking to provide their own solutions to boost food supply. Traditional ag companies such as John Deere are investing hundreds of millions of dollars to add digital functionality to equipment, in the form driverless tractors and intelligent spraying devices using AI.


ACTORS ENTERING THE AGTECH SPACE

 **Big tech:** Microsoft and Google lead investments into agriculture. Google recently backed an online farmers marketplace, while Microsoft is working on farmers' IoT solutions with its FarmBeats moonshot venture. Samsung introduced LED lights to improve indoor agriculture systems, and IBM is leading efforts to build effective blockchain technology in the food industry with the IBM Food Trust which it joint developed with Walmart.

 **Startups:** The bulk of investment is backed by venture capital entering startups offering a broad range of solutions for agriculture. Agtech startups raised \$19.8 billion in 2019 across 1,858 deals, with alternative protein company Beyond Meat reaching a market capitalization of \$9 billion in the year following its IPO on the NASDAQ exchange.

 **Pharma & Biotech:** The development of genetically modified seeds starting in the 1960s along with no-till farming changed the entire agriculture industry, with huge adoption across North and South America especially. Farmers willingness to use GM seeds, for some, proves that they are willing to adopt technology if there is a clear economic benefit.

 **Telecommunications & Satellites:** Telecommunications companies in particular have targeted agriculture recently since they expanded Internet coverage to rural areas of the world. AT&T is working on IoT solutions to improve water use on farms, while Huawei is promoting cloud-based farming software across the world.

 **Farm Machinery:** Companies such as John Deere are ploughing profits back into digitalization and robotics. While the car industry is working towards driverless vehicles, this is already a reality in the farming industry. Deere and competitors such as Agco are working hard to offer an array of precision farming tools to gain an edge over competitors.

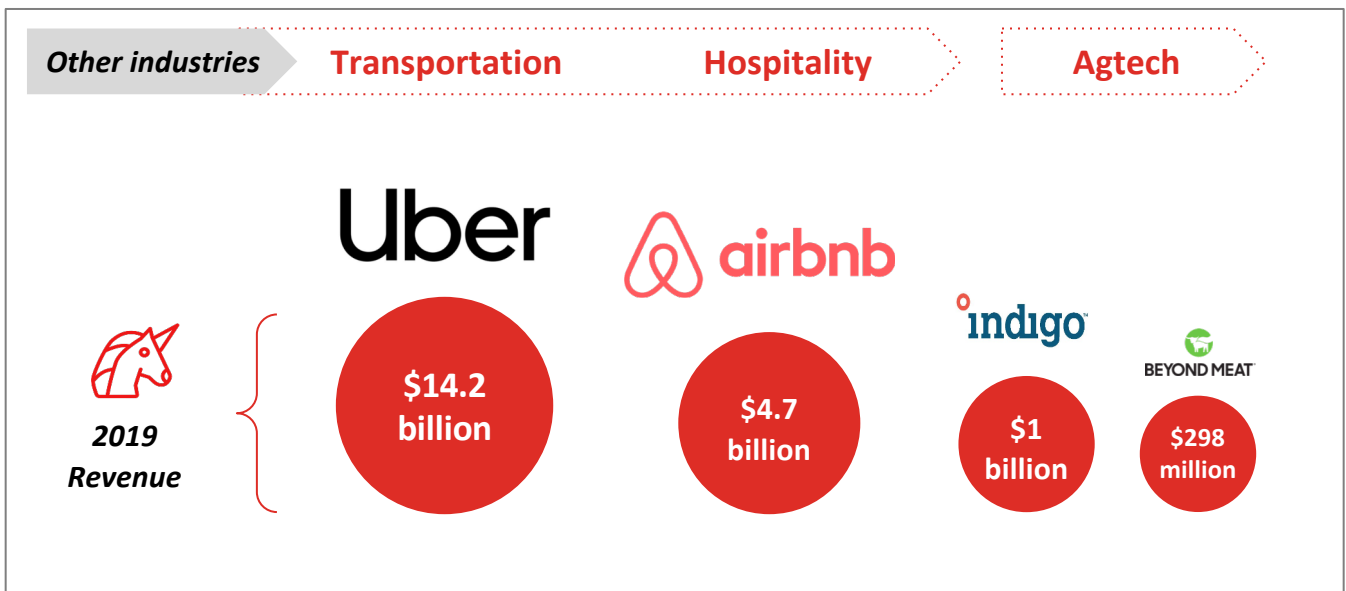
The overriding trend that is driving the Agtech movement forward is the huge advancement in Internet accessibility. Farmers have access to the outside world via the mobile phone, opening up an array of new possibilities to boost profitability. We explore some of these areas in further detail.

DISRUPTION IN AGRICULTURE LAGS OTHER INDUSTRIES

Technology has transformed other traditional industries, from Uber with its ride-hailing app to Airbnb offering private houses and apartments to provide alternative hotel accommodation. So far, few unicorns (defined as private companies with >\$1 billion in valuation) have emerged in agriculture.

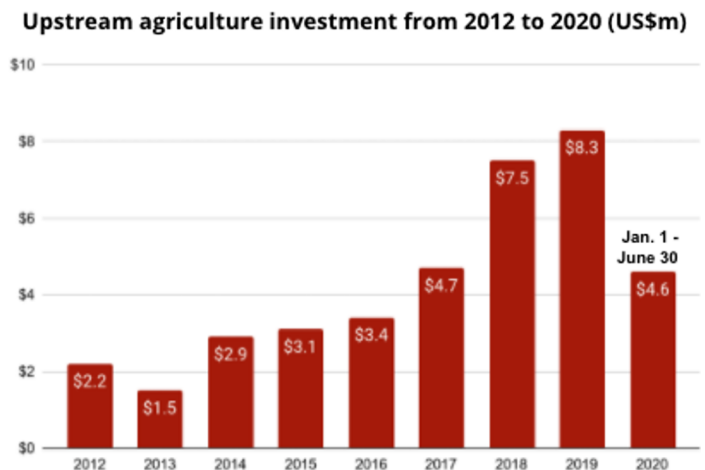
Indigo Ag, a company that uses microbes to protect plants, became the first so-called unicorn to achieve >\$1 billion in revenue in agriculture. Beyond Meat, an alternative protein maker that makes lookalike beef patties from plants, is earning ~\$300m a year.

THERE ARE UNICORNS IN THE AGTECH SPACE, BUT NO UBERS



Digital transformation could generate \$500 billion in additional value for the agriculture industry, according to a study by McKinsey.

The reason why agriculture has yet to see a unicorn that generates tens of billions of dollars in revenue was a lack of early interest in the space, according to AgFunder co-founder Rob Leclerc. The dollar inflows going into upstream agriculture investment in 2018 and 2019 could be the genesis of bigger unicorns in years to come.

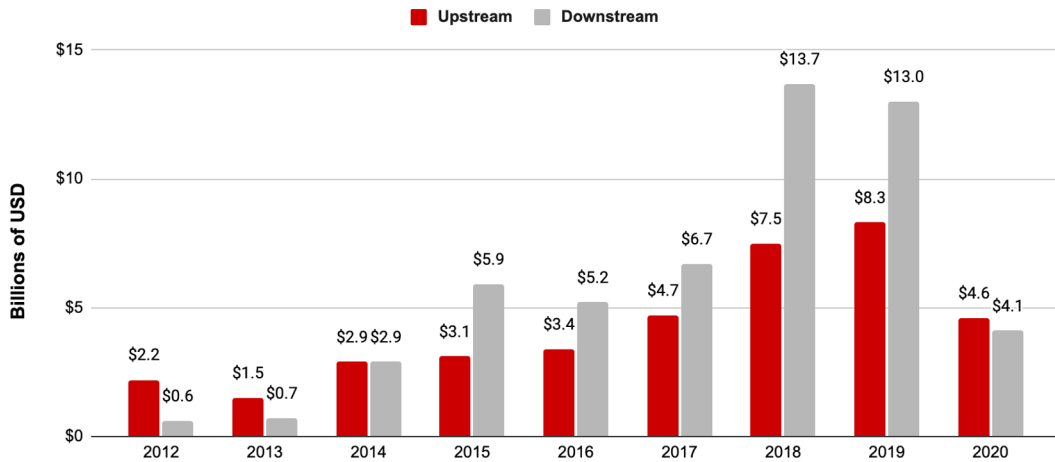


Source: AgFunder

BIG DOLLAR DEAL FLOW

Earlier flows into the Agtech space were focused on downstream areas of the food business, creating online marketplaces and B2C platforms. The huge dollar inflows seen in 2018 and 2019 were more heavily stacked towards bringing digital technology to the essence of farming.

Investments in distribution and food delivery dominate deal flow



Source: AgFunder


BIG DEALS IN AGTECH

Monsanto's \$930m purchase of Climate Corp., a company that underwrites weather insurance for farmers, marks the advent of the Agtech investment boom. The Climate platform was created by former Google engineers who disrupted a previous over-the-counter approach to ag insurance. Bayer, Monsanto's current owner, is still working on achieving Climate's full potential.

DuPont, a company founded in 1802, paid \$300m for ag software startup Granular based in San Francisco, that helps farms improve efficiency and sustainability. The deal also provided DuPont with a leading online marketplace for farmland real estate.


Leading tractor manufacturer Deere invested in a company that developed a robotics-led technology that can significantly reduce herbicide usage.


M&A deals




\$930m

In 2013










\$300m

In 2017









\$305m

In 2017



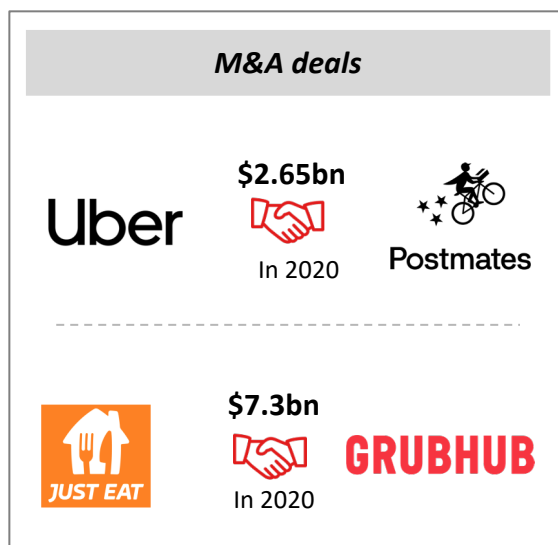


BIGGER DEALS IN FOOD-SERVICE DISRUPTION SO FAR

The food delivery industry, which is also part of the Agtech universe, has seen much bigger M&A deals when compared with upstream agriculture and food production investments.

Most of these investments have been in Europe, Asia and North America. The pandemic has boosted interest in the food delivery sector, generating a new wave of multi-billion dollar buyouts.

For now, downstream food delivery deals are expected to outpace food production investments. But the trend is moving towards investments further upstream in the supply chain.



TOP LATEST DEALS IN AGTECH

Upstream agriculture venture capital deals are starting to grow in stature, rivalling food delivery applications in the Agtech universe

Company	Sector	Raised value	VC stage	Date
Benson Hill	Genomics/seeds	\$150m	Series D	October 2020
Pivot Bio	Microbial	\$100m	Series C	April 2020
Inari	Genomics/seeds	\$89m	Series C	August 2019

Top latest deals recorded during the first half of 2020 showed how upstream Agtech is catching up with the food service sector

Company	Sector	Raised value	VC stage	Date
Impossible Foods	Alt-proteins	\$500m	Series F	March 2020
MissFresh e-commerce	E-Grocery	\$500m	Series E	May 2020
DoorDash	Food Delivery	\$400m	Series H	June 2020
Toast	Restaurants	\$400m	Series F	February 2020
Samsara Networks	IoT	\$400m	Series F	May 2020
Apeel Sciences	Biotech	\$250m	Series D	May 2020

AGTECH ADOPTION

Despite significant dollar deal flow, Agtech adoption has been slow to evolve and many earlier ventures have failed to deliver payback to investors. Slow adoption may be down to the fact that farmers can't see a clear value proposition from data collecting devices, according to accelerator fund FoodShot Global. Newer startups are trying to create devices that have a clear value proposition.



It feels like it's the second inning, and the coaches are back on the bench thinking about the game plan."

Ken Zuckerberg, Rabobank Analyst

There is a wide array of estimates on what is the compound annual growth rate (CAGR) for Agtech adoption, partly because it is measured in different ways. Huawei predicts smart agriculture on a global scale will grow 14.3% a year, becoming a \$26.8 billion market by 2020. Software firm SAP estimates the precision agriculture market was worth \$3.7 billion in 2018 and is growing at 13% a year.

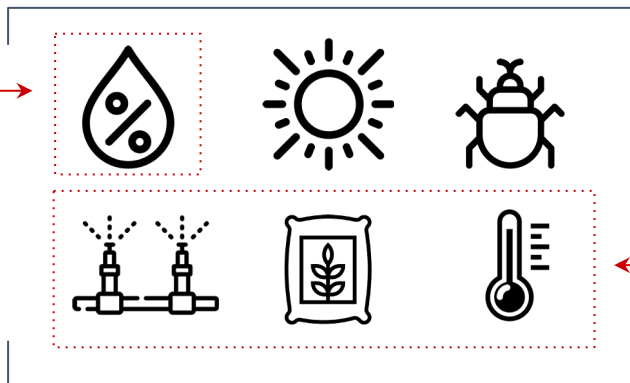


SLOW ADOPTION MAY BEEN DOWN TO THE WIDGET PROBLEM



Widget problem

Solves a single problem in isolation



System Integration

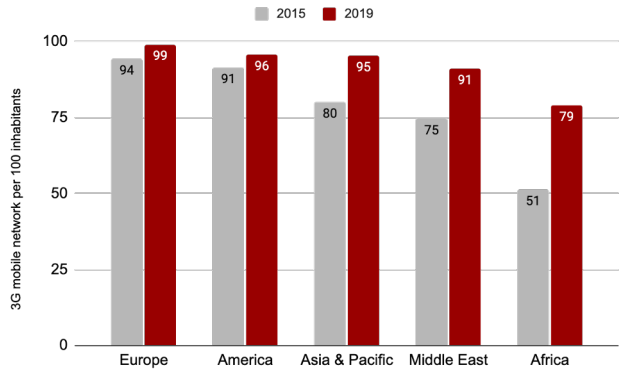
Product/service fits into farming system

After some significant early failures, some entrepreneurs are beginning to focus on innovation that improves farming systems, paying particular attention to how their product or services interfaces with others and fits within the reality of a real farm in both developed and developing countries

THE INTERNET WILL CONTINUE TO EMPOWER FARMERS

Most farmers around the world are now connected to the outside world via a mobile phone. The Internet has allowed farmers to conduct their own price discovery, tap shared knowledge networks and discover better prices for farm inputs. Rural connectivity has empowered farmers and will continue to do so. The trend has forced big agriculture companies to adapt their business model. Big grain and oilseed trading companies including Archer Daniel Midland, Bunge, Cargill and Louis Dreyfus (collectively known as the ABCD), are working hard to provide digital platforms to farmers to continue to be a trusted source of information and provide value.

Africa, the region with the most number of rural farmers has the biggest growth in mobile phone connectivity



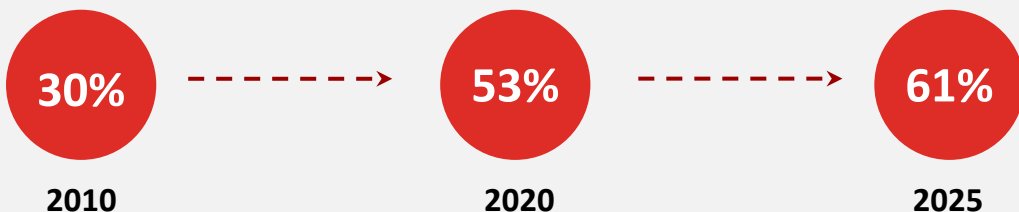
Source: International Telecommunication Union (ITU)

THE EFFORT TO GET MORE FARMERS ONLINE



Telco companies have targeted investments in agriculture as they extend Internet coverage to rural areas of both developed and developing countries. McKinsey estimates connectivity technologies like fiber, Wi-Fi 6 and Low-to-mid band 5G, besides Low Earth orbiting satellites (LEOs), will further boost farmers access to the outside world. Widespread internet coverage may allow continents such as Africa to avoid the use of legacy technology and leapfrog to modern farming practices.

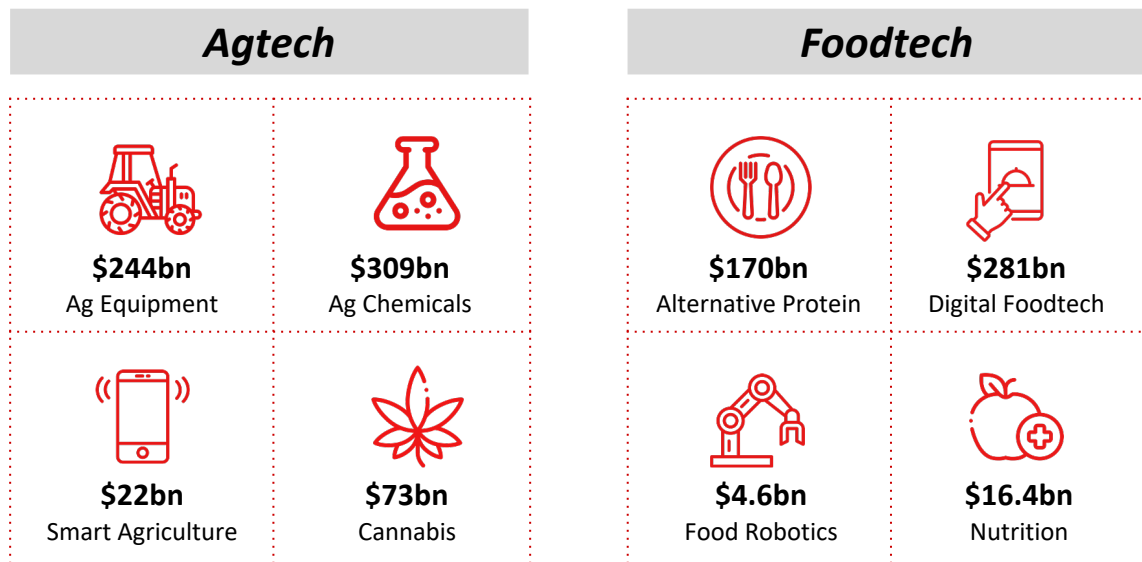
Percentage of the global population with internet access



Source: GSM Association, ITU

BREAKING DOWN THE AGTECH UNIVERSE

Projected market sizes by 2025



Source: AgFunder

Ag Equipment – mainly traditional companies such as Agco and John Deere building new digital capabilities

Agro-Chemicals – digital solutions will allow farmers to reduce chemical usage. Agro-chemical suppliers will need to adapt to this new reality

Smart Agriculture – R&D investment is at an all-time high. Solutions are expected to improve as innovators move beyond producing widgets to integrated solutions

Cannabis – the rapid ascent of the cannabis industry since legalization in Canada and some parts of the United States has to some extent proved the viability of indoor farming technology when growing a high value crop

Alternative Proteins – this sector has received huge dollar inflows in the last couple of years, from farmers of insect protein to meat-like products derived from plants. Further developments are expected in the lab-based meat space

Digital Food-Tech – digitalization is disrupting every single of the food supply chain, from distribution to delivery services to consumer

Food Robotics – robots that handle food already operate in food packing plants and dairy farms. It could become especially relevant for agriculture, especially in areas with labor shortages

Nutrition – investments in nutrition will continue at a strong pace as the healthcare industry turns to preventive nutrition to prevent or delay disease

| IN CONCLUSION

Agtech is one of the hottest investment classes of 2020. Investors are backing companies that are pursuing ways to improve the global food system, regardless of the economic slump caused by COVID.

Dollar deal flow is beginning to enter upstream farming, having been concentrated in distribution areas of the food industry during the earlier stages of the boom. Alternative proteins — aquaculture, insects, plant-based proteins, lab-based meat and precision fermentation — will supply more of the protein needs for a growing world population.

Sensors and robotics will become an essential feature of farming. Innovators will need to move beyond producing widgets to providing components of an integrated system. Agtech could well be mid-stage through the Gartner hype cycle, with earlier investments deceiving investors. Second generation investments and emerging best practices are likely to spark significant adoption and growth.



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AUTHOR

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