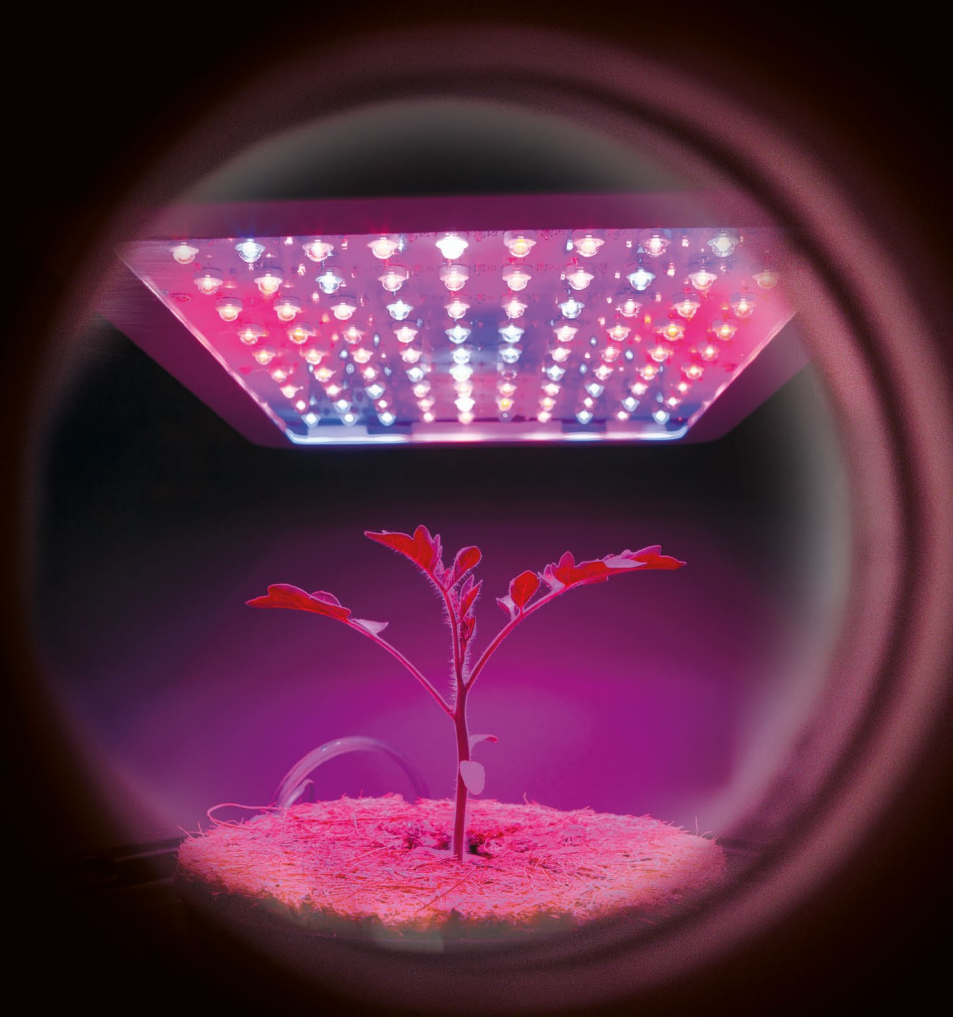


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From Agriculture to AgTech

An industry transformed beyond
molecules and chemicals



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From Agriculture to AgTech: Executive summary

The agricultural industry is about to be disrupted and will transform into a high-tech industry

From Agriculture to AgTech: an unseen boom in agricultural venture capital investment leads to a major disruption and foreshadows the millennial shift from family farms to smart “food factories”.

Today's agricultural industry is on the verge of turning into a high-tech industry, as the growing number of agricultural startups and investors shows.

Disruption driver No. 1

Ten global megatrends that impact agriculture clearly intensify the transformation:

1. A growing population
2. Societal and demographic changes
3. Increasing urbanization
4. Climate change
5. Smart agricultural technologies
6. Biotechnology
7. Servicization around core products
8. Increasing value chain integration
9. Globalized trade
10. Changing international regulations

Disruption driver No. 2

Partly complementary, partly concurrent, industry-specific change accelerators in three categories are amplifying the speed of disruption in agriculture:

1. New consumer preferences:

the demand for personalized, on-demand products and increasing awareness for health and sustainability.

2. Emerging technologies:

developing biological tissues, advanced manufacturing technologies, autonomous vehicles, and connected devices.

3. Changing value chain and firm configurations:

growing trend towards horizontally and/or vertically integrating adjacent offerings.

Three high-impact growth opportunities

As a consequence of the identified disruption drivers, the agricultural ecosystem faces new challenges, from which three significant growth opportunities for current and future players can be derived:

1. Improving yield efficiency

The world population, of which 10% remain undernourished, is rapidly growing, thereby creating severe urgency to increase yields.

2. Increasing supply chain efficiency

Reducing the average value chain loss of 33% of initial production is a substantially stronger lever in increasing effective output than upfront yield improvement.

3. Decreasing complexity along farmers' value chain

Since today's farmer already faces high complexity and tomorrow's farmer will deal with even more players and technologies after the disruption, farmers are willing to pay for integrated solutions and ecosystems.

The fourth agricultural revolution is already on its way and you should invest now

How innovators capitalize on growth opportunities and plant the seeds for the fourth agricultural revolution.

Various innovators are trying to harness the three growth opportunities. While traditional venture capital firms are only slowly getting involved, large agrochemical players are already investing heavily in agricultural technology – "AgTech". Looking at the agricultural ecosystem, there are five major innovation fields in which innovators are increasingly active:

1. Rerouting value chains:

multiple players are trying to bridge or skip value chain steps by direct-to-consumer delivery, meal kits, food e-commerce etc. to reduce supply chain inefficiency.

2. Crop efficiency technology:

start-ups and cross-industry innovators offer drones, robots, big data and sharing platforms as well as irrigation, soil, and crop technologies to increase effective yield.

3. Bio-chemicals and bio-energy:

attempting to reduce the ecological footprint, innovators develop biologically-produced agrochemicals and bio-materials and engage in producing bio-energy.

4. Food technology and artificial meat:

since it takes eight kilograms of grain to produce one kilogram of meat, firms are developing plant-based meat and eggs to harness "sustainable protein".

5. Contained and vertical farming:

one of the youngest innovation fields, smart greenhouses and contained farming are about to take off.

How venture capital is fertilizing the revolution

After more than doubling from 2014 to 2015, AgTech investment is on an exponential growth path and follows the steps of FinTech, surprising traditional and long-established players.

Where the revolution is blooming

Starting from the US, other countries like Israel, China and India are also catching on to the fourth agricultural revolution, digging into more innovation fields along the way. The investment focus will shift away from the mature food e-commerce sector to a more diversified portfolio of innovation fields and targeted value zones.

Why it's the right time to invest in AgTech

1. Unseen, rapid growth:

AgTech is not on the radar of traditional investors yet, but investments grew at 63% CAGR from 2010–2015, like FinTech.

2. Low-hanging fruit:

existing players are willing to invest 10-15 years and up to \$250 million per product launch, while innovators are finding lean solutions and going for low-hanging fruit.

3. Huge market potential:

by tapping into the large 3 trillion dollar global agricultural market, investors can expect high scalability and significant ROI.

The fourth agricultural revolution is about to disrupt the industry – to be ready to harvest, have your GrowthPath® strategy prepared.

Disruption driver No. 1

Ten impactful megatrends are creating the foundation for transforming agriculture into a high-tech industry



The ten global megatrends will lead to a disruptive transition in the next 5-10 years, in interplay with more industry-specific change accelerators.

Disruption driver No. 2

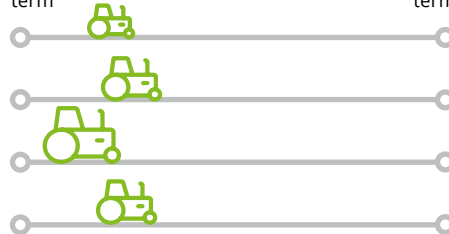
Industry-specific change accelerators will amplify the intensity of the transformation, varying by time and level of impact

New consumer preferences

- 1 Demand for personalized products and solutions
- 2 Increased health awareness in food consumption and supply traceability
- 3 Expectation to consume services and products on demand
- 4 Reduction of ecological footprint and demand for sustainability

Short term

Long term



Small impact



Medium impact



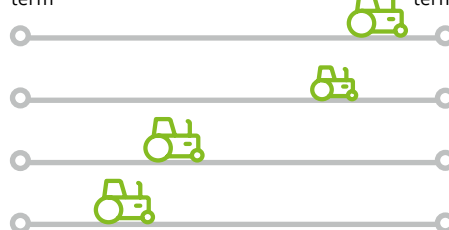
Large impact

Emerging technologies

- 5 Advanced application of biological technologies, tissues, and organisms
- 6 Advanced manufacturing technologies including 3D printing and robotics
- 7 Autonomous vehicles that perform tasks like phenotyping or fumigating plants
- 8 Devices and sensors communicating data via mobile and smart connectivity

Short term

Long term



Changing configurations

- 9 Horizontal integration of adjacent offerings along the agricultural ecosystem
- 10 Accessing, processing and analyzing big data to optimize yield
- 11 Vertical integration of input suppliers to optimize cost, efficiency and complementarity

Short term

Long term



The agricultural disruption will be accelerated by new consumer preferences, emerging technologies and changing firm and value chain configurations, leading to new challenges for agricultural players. While the intensity of the impact varies, most change accelerators will happen in short- to medium-term.

Key challenges and opportunities

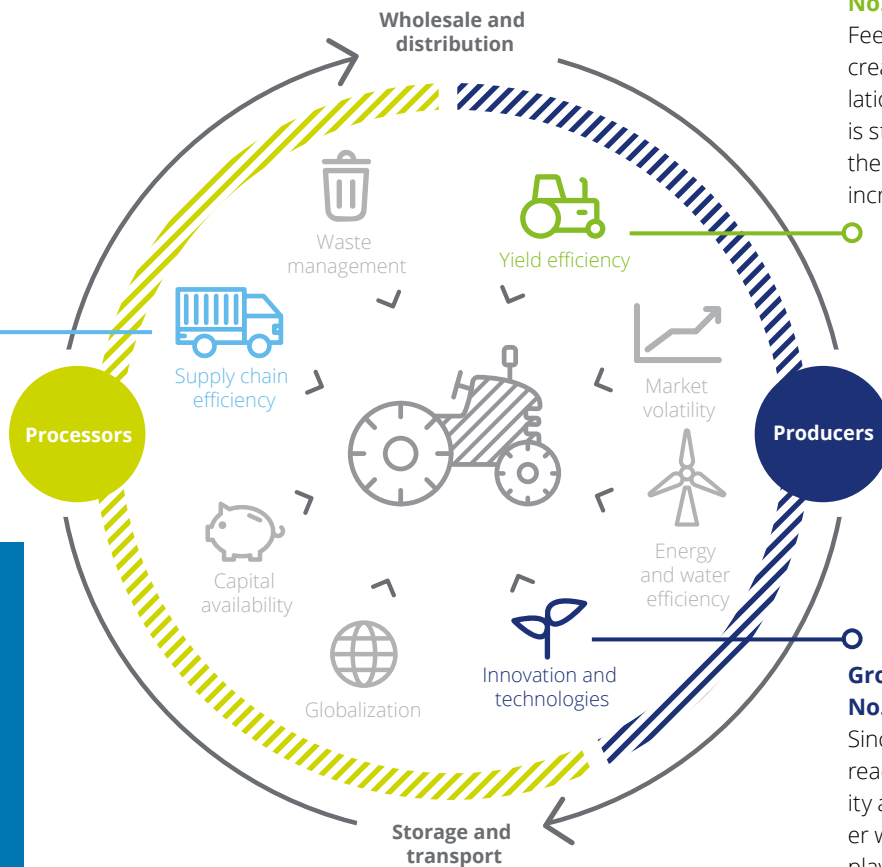
Due to the effect of disruption drivers, agriculture faces challenges that offer significant, untapped growth opportunities

Growth opportunity No. 2

Even though technology has already reduced supply chain losses, the average losses of 35% of initial production means that a large amount of value is lost

Growth opportunity No. 1

Feeding a growing and increasingly urbanized population, of which about 10% is still undernourished, there is severe urgency to increase yields.



Growth opportunity No. 3

Since today's farmer already faces high complexity and tomorrow's farmer will deal with even more players after the disruption, farmers will be open to integrated solutions and ecosystems.

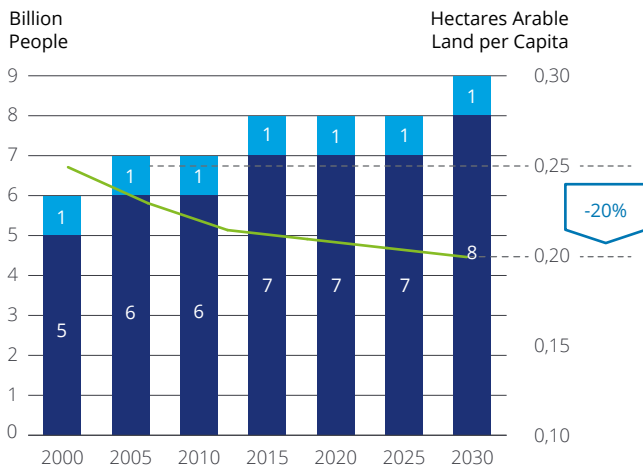
Confronted with global trends, regulators, and strong market forces, agribusinesses are driven to rethink their business models, which offers veritable growth opportunities for existing and new players alike.

Growth opportunity No. 1

Players can capitalize on the remaining yield improvement potential of 30% to feed a growing population

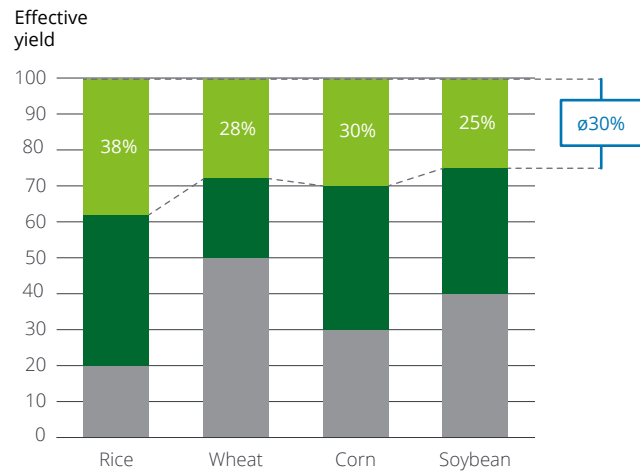


Notwithstanding a 20% decline in arable land per capita from 2000 to 2030, three billion more people will be nourished



- World Population, undernourished
- World Population, nourished
- Yield with no crop protection

Yields on key crops still exhibit a remaining improvement potential of 30% on average



- Remaining potential
- Extra yield from crop protection
- Yield with no crop protection

The necessity of increasing production in the face of declining arable land represents a great growth opportunity for players who can improve effective yields, as farmers are willing to invest past profits to gain future efficiency.

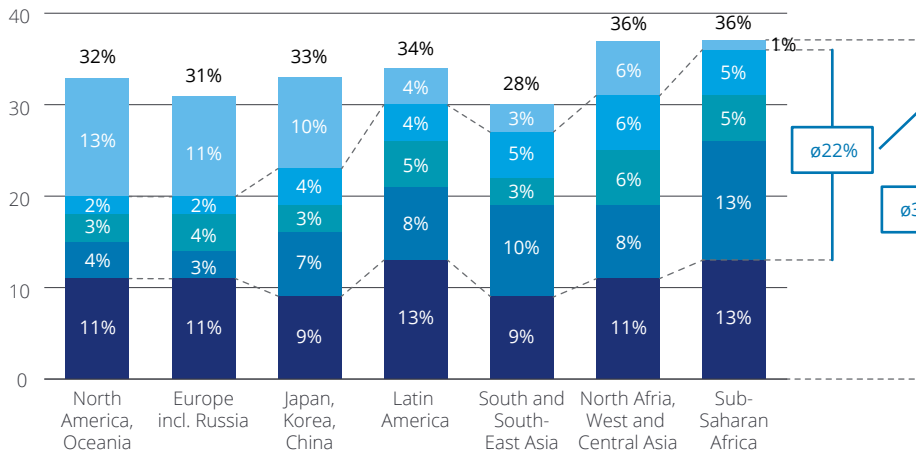
Growth opportunity No. 2

Reducing only a part of the 33% average value chain losses is a stronger lever than pure yield increase



Value chain losses per processing step by region, as a percentage of initial production

Percentage lost of initial production



- Consumption-level losses
- Distribution losses
- Processing and packaging losses
- Post-harvest losses
- Harvest losses

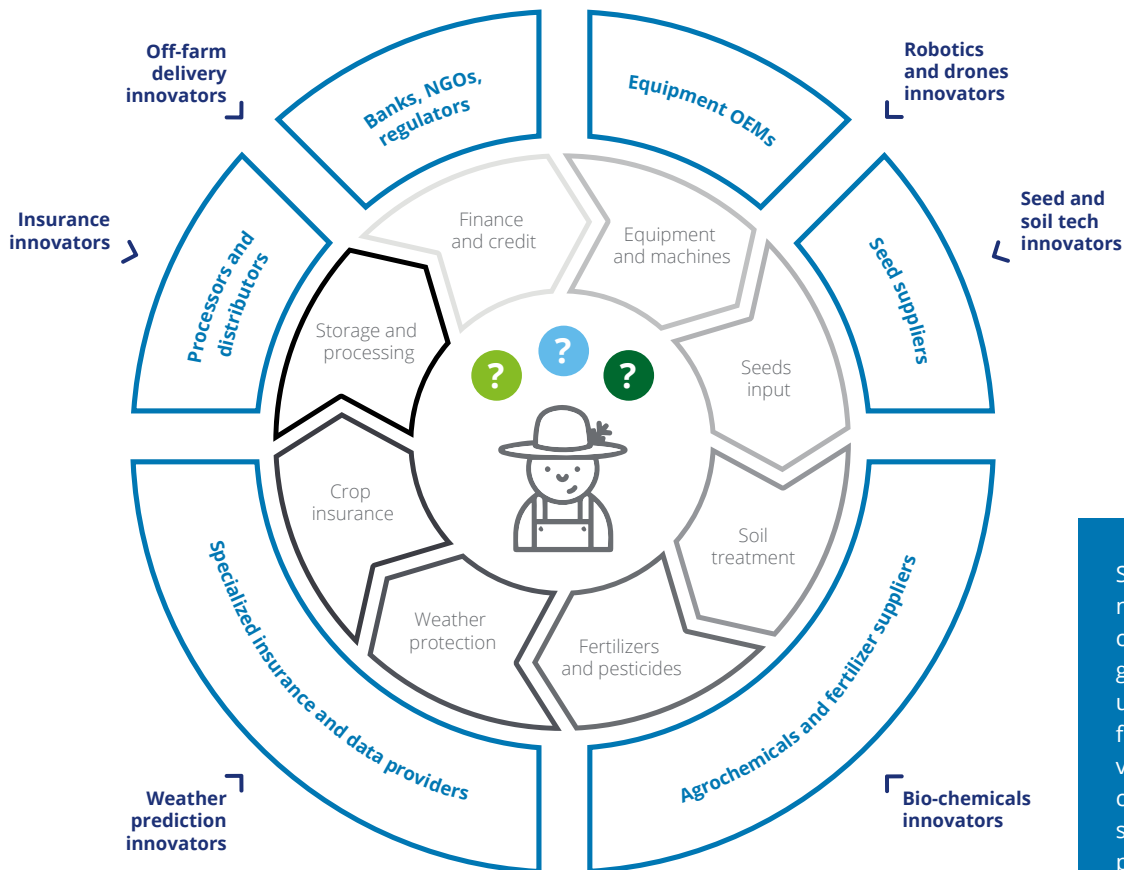
Up to 22% yield losses could be saved with more efficient supply chains, particularly in in population-rich, developing economies.

In order to compensate 33% of value chain losses, an unfeasible 50%¹ yield increase would be necessary, while increasing supply chain efficiency by only 5% points has the same effect as a 10% yield improvement.

¹ The production increase needed to compensate 33% losses is 50%, since losses need to be deducted from any potential yield by dividing it by the effective yield.

Growth opportunity No. 3

Today's farmer already faces high complexity, but tomorrow's farmer has to cope with even more

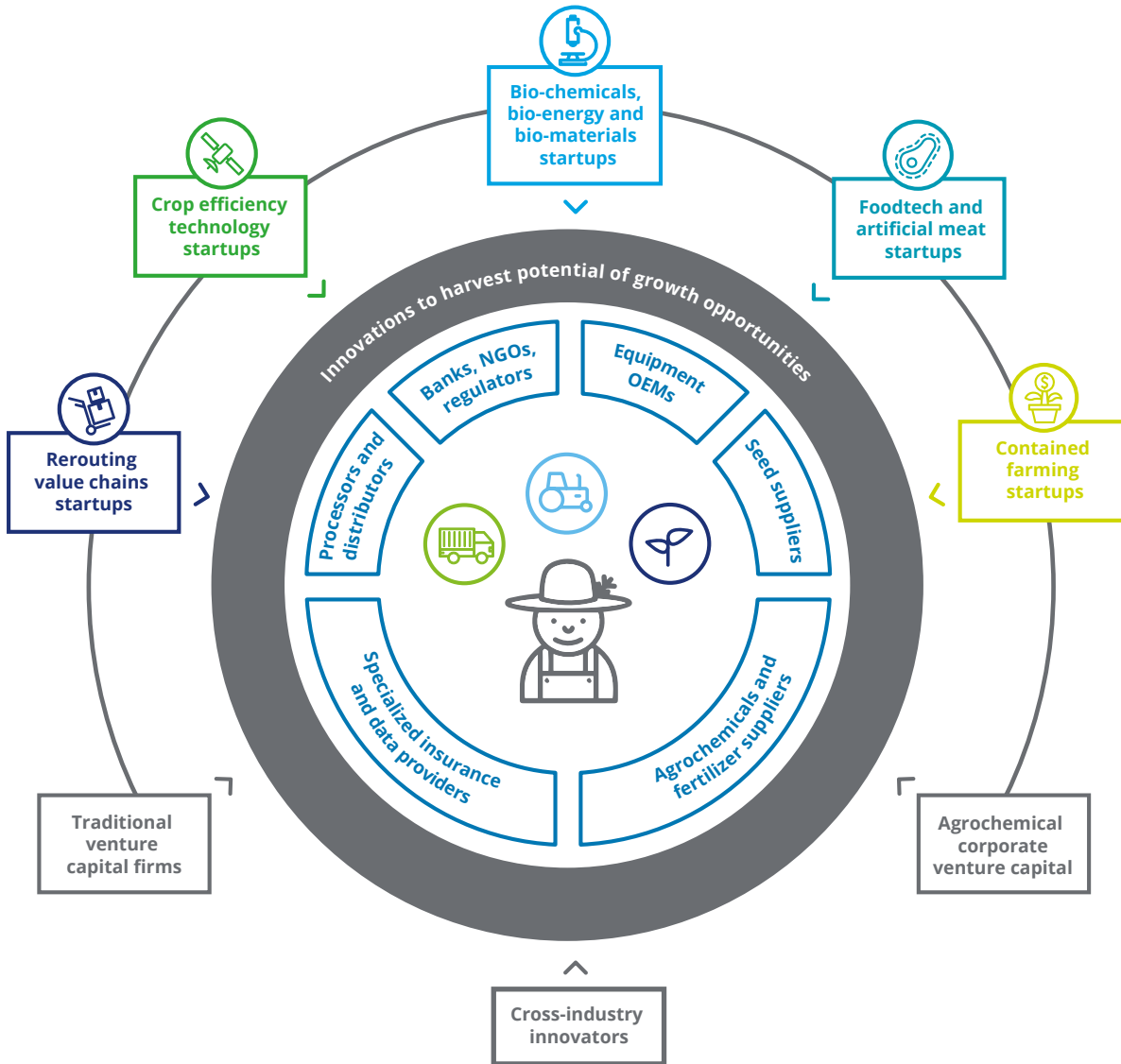


Since tomorrow's farmers need to deal with higher complexity and a rapidly growing amount of product and service offerings from different input providers along their value chain, they will strive for simple, ease-to-use, complexity-reducing products, offered as integrated end-to-end solutions.



Planting the seeds: five major innovation fields

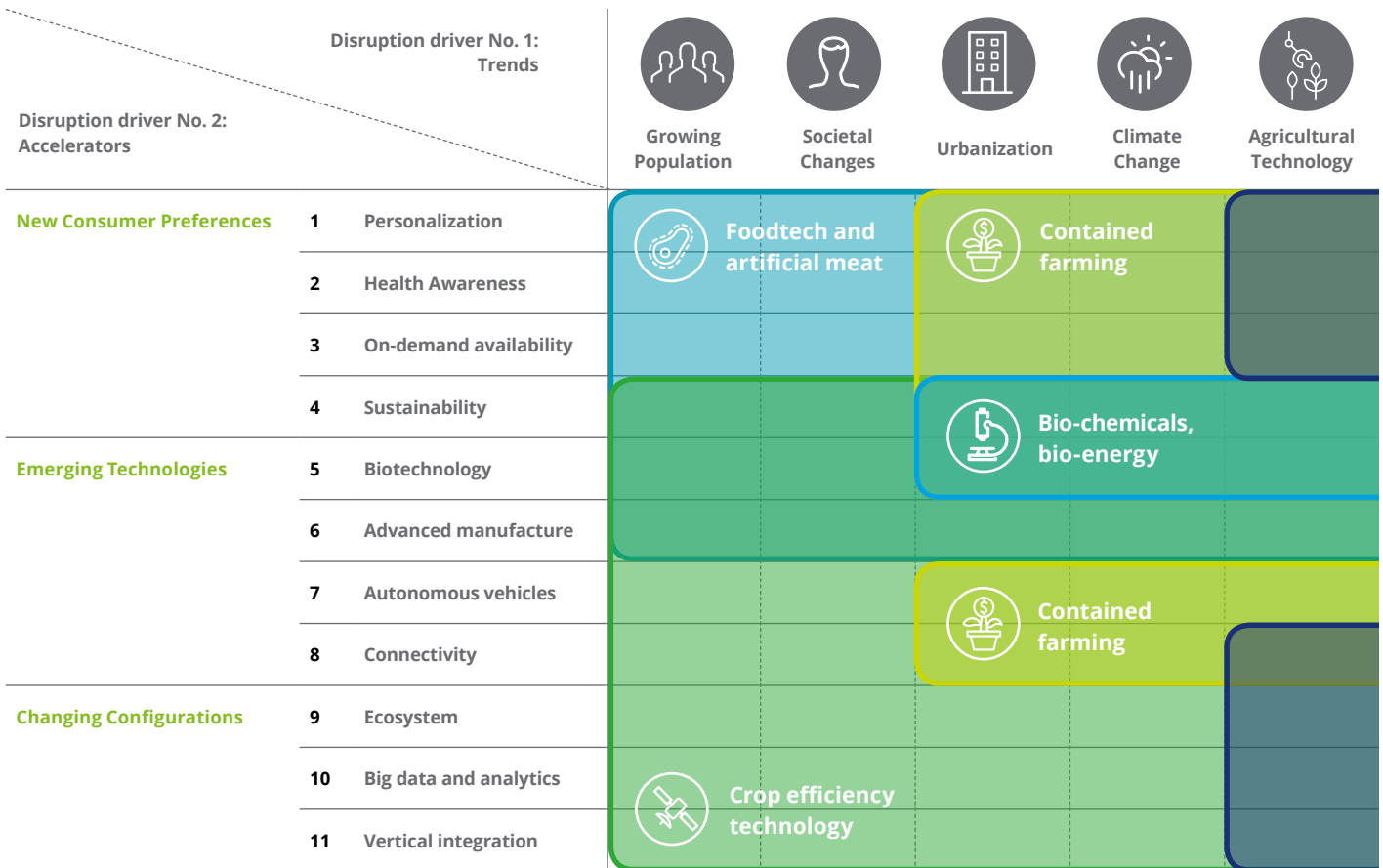
Startups, cross-industry innovators, and supportive venture capital firms are increasingly active in five major innovation fields

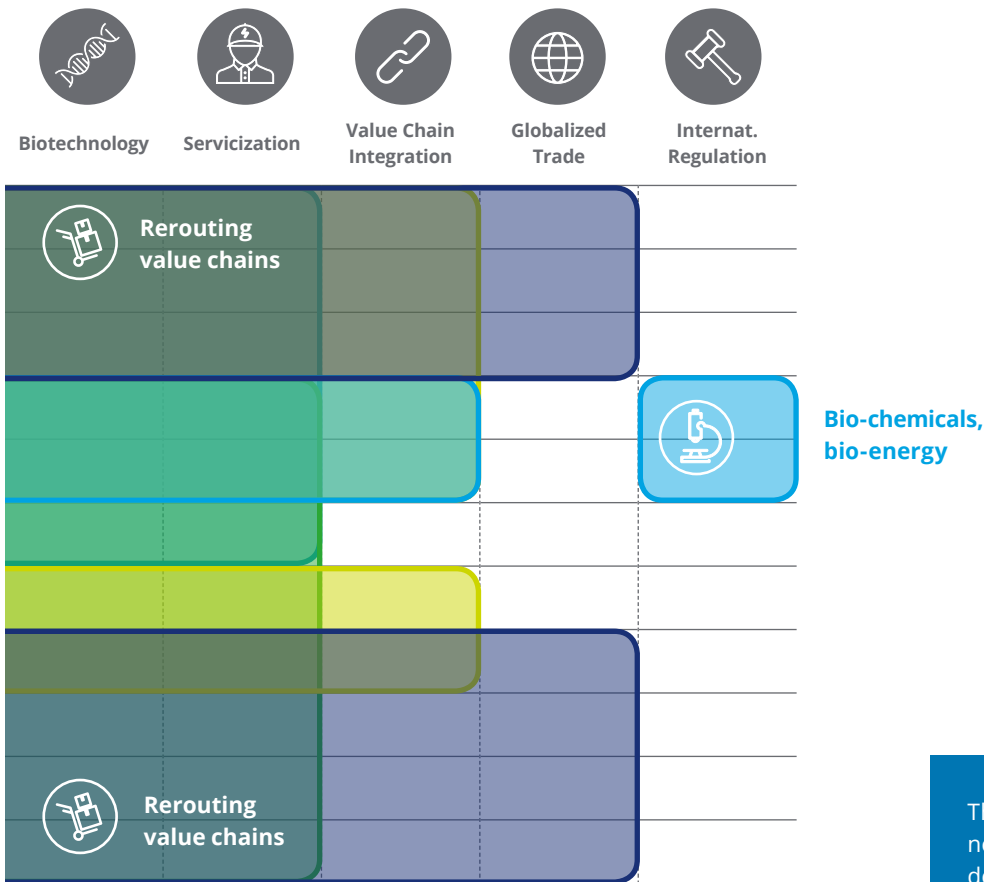


Not only startups are finding solutions to harvest growth opportunities, as existing agrochemical players and cross-industry innovators also join the field.

Planting the seeds: creating new value zones

Innovators are leveraging disruption drivers, but value zones are no more than skimmed on the surface





The mapping of the five identified innovation fields with disruption drivers depicts strong value zones into which new and existing agricultural players can tap with smart solutions to capture value and growth potential.

Planting the seeds: how innovators capture value

Smart agricultural technology – "AgTech" - innovators harvest these value zones by building simple, customer-centric solutions

Identified innovation fields



Rerouting value chains

- Reducing inefficiencies along the value chain
- Includes farm2consumers, waste reduction tech and other technologies



Crop efficiency technology

- Increasing yields at decreased input
- Includes satellite imaging, drones, robotics, artificial intelligence, big data, irrigation tech and soil tech



Bio-chemicals and bio-energy

- Ongoing trend to biological production technologies
- Includes bio-energy production, bio-chemical and bio-materials



Foodtech and artificial meat

- Fairly new trends towards replacing meat
- Includes artificial meat and other sustainable protein technology as well as foodtech



Contained farming

- Newest investment trend in the AgTech sector
- Vertical farming is largely focused on greenhouse and indoor farming technologies, hydroponics, etc.

Innovators' solutions to capture value zones



Meal kit delivery, off-farm delivery, e-groceries, crop waste reuse, food waste reuse and reduction, shelf-life enhancing and monitoring



Agricultural data analytics, robots, drones, sensors, IoT monitoring, farm equipment sharing, efficient irrigation systems, soil and crop tech, smart phenotyping, satellite imagery



Biologically produced agrochemicals, microbe-based bio-engineering, bio-crop and -seed, bio-plastics, bio-energy, bio-gas plant technology



Plant-based meat and egg substitution, sustainable protein, genome engineering, livestock genetics, macronutrient products



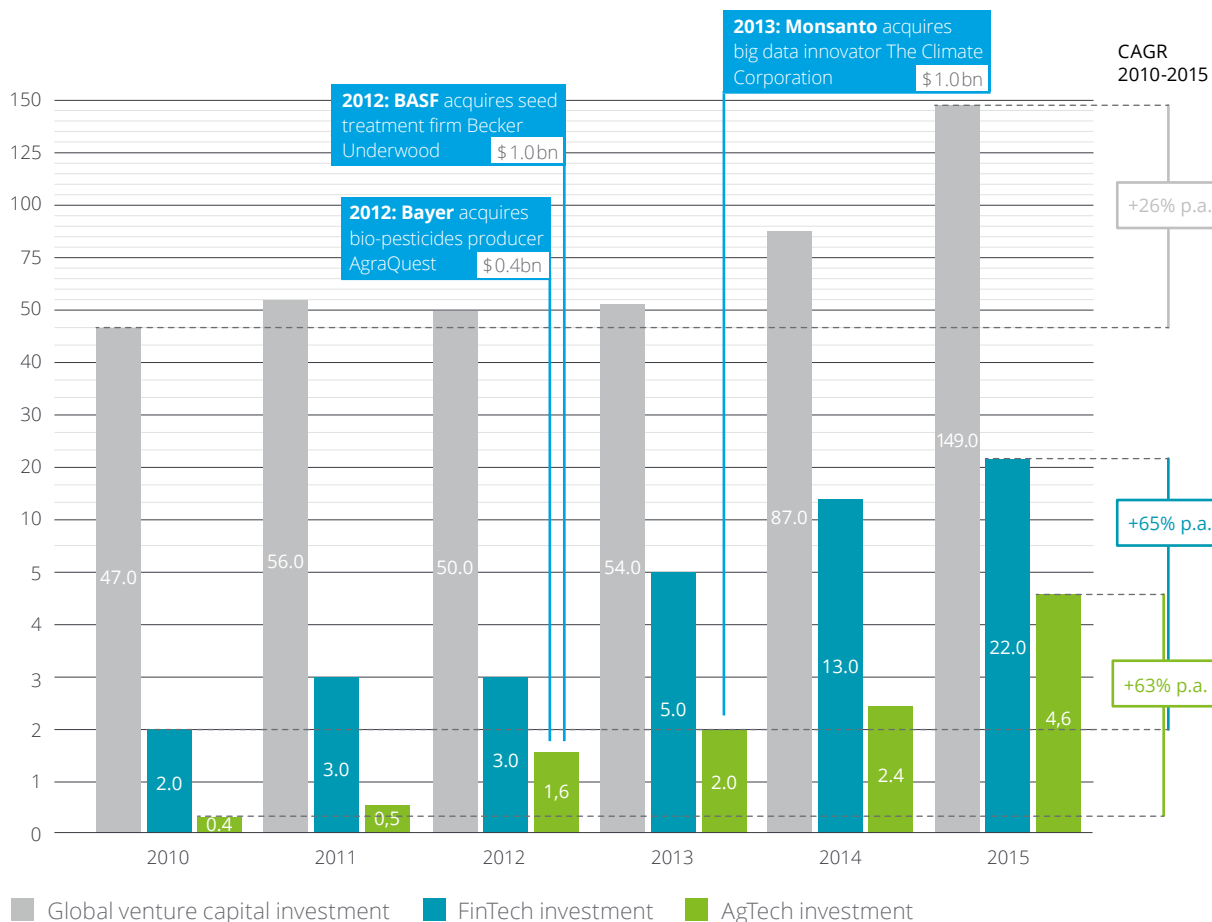
Smart indoor agriculture, vertical farming, contained farming data and tech platforms, LED lighting, aqua- and hydroponics

The AgTech disruption is taking place in multiple innovation fields simultaneously. Innovators are offering specialized, but simple, often fully integrated solutions ranging from direct delivery services through satellite imagery to automated indoor farming.

Fertilizing the revolution: venture capital's role

Venture capital investment and successful exits are fertilizing the AgTech revolution, which follows the disruptive growth of FinTech

Total, FinTech, and AgTech venture capital investment 2015 in billion USD

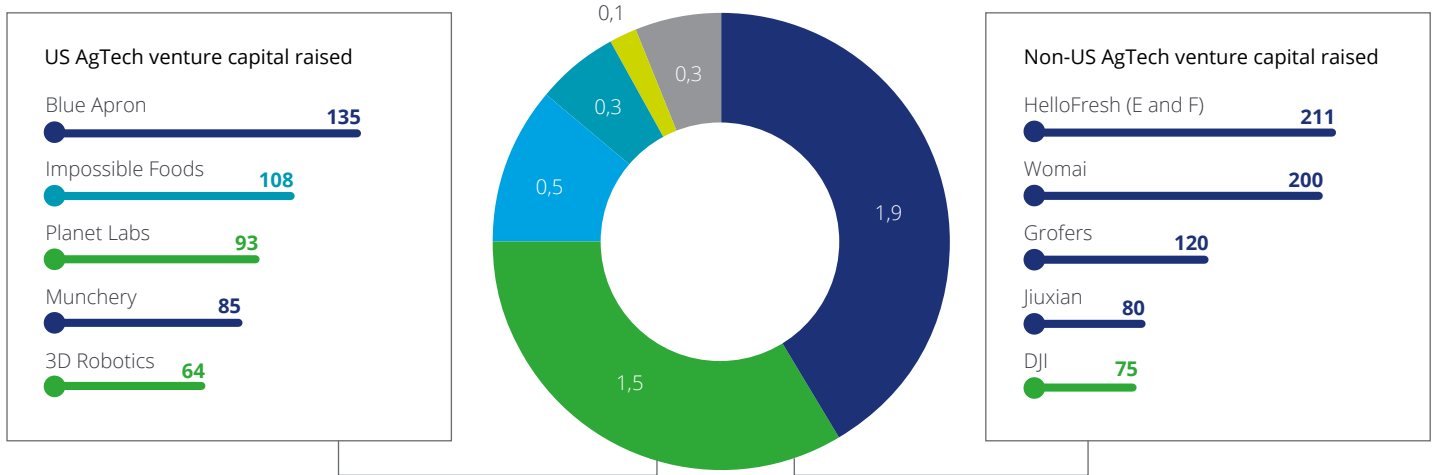







Note: FinTech refers to startups in the finance and banking industry, while AgTech refers to startups in the agricultural industry

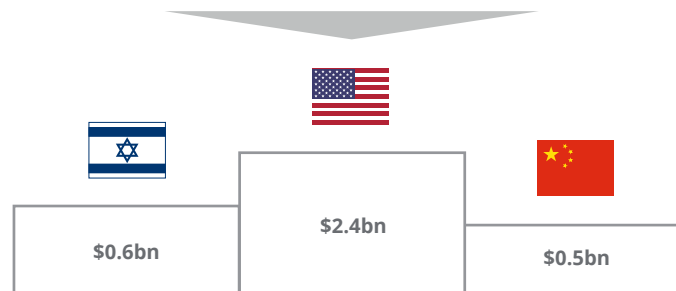
Source: United Nations; FAO, Syngenta, Monitor Deloitte research

Fertilizing the revolution: where it is blooming

While non-US investors are still focused on the mature food e-commerce sector, AgTech is taking off in the US, Israel and China



-  Rerouting value chains
-  Crop efficiency technology
-  Bio-chemicals and bio-energy
-  Foodtech and artificial meat
-  Contained farming



Starting from the US, the investment focus is shifting towards countries like Israel, China and India, with investors increasingly diversifying their portfolios and digging into new innovation fields along the way.

Fertilizing the revolution: why you should invest

The fourth agricultural revolution is taking on steam - three reasons why now is the right time to invest and lead the disruption



1.

Unseen, rapid growth

AgTech investment is not yet on traditional investors' radar, and early investors can participate in the growth of 63% CAGR from 2010-2015.



2.

Low-hanging fruit

Existing players invest 10-15 years and up to \$250 million per product launch, while start-ups will go for lean, low CAPEX solutions.



3.

Huge market potential

Tapping into agricultural growth opportunities, investors can take a share in the 3+ trillion USD global agricultural market.

Monitor Deloitte GrowthPath[®] services

How Monitor Deloitte can help you grow

Strategy is about choices. We work side by side with our clients to make the choices that will help stretch and sharpen their ambition. We understand that strategy stands or falls on execution – and we are known for delivering ‘executable strategy’. With over 15,000 dedicated practitioners in our global S&O network, Deloitte’s Strategy practice has the scale, breadth and depth to deliver genuine impact and insight to our agri-business clients.



Monitor Deloitte supports you with our proven GrowthPath[®] approach and an integrated M&A service portfolio. We will lead you through the process of defining your M&A strategy, deciding where to play, drafting scenarios on how to win, and configuring successfully.

Monitor Deloitte M&A services

Our M&A portfolio

Monitor Deloitte professionals are focused on helping you derive the optimal value for your firm. We provide comprehensive, cross-functional support to acquirers and vendors. Leveraging industry expertise and functional specialists from across the Deloitte network, we add more value to an acquisition than pure due diligence, delivering seamless incremental services that help you achieve a competitive advantage.



M&A strategy

Whether you want to grow market share or add new competencies, a well-crafted growth strategy will help better prepare you to recognize the opportunities.



Target screening

A structured target screening process will benefit in both areas by helping to define your acquisition criteria ahead of time.



Approach, negotiate, and structure

We will lead you through the process of valuation, evaluate the benefits of the acquisition, and perform a comprehensive assessment of the targets.



Due diligence

Evaluating a target candidate's relevant sources of value and identifying any possible risks can significantly increase your chances of a successful deal.



Transaction execution

Closing a deal can be like hitting a moving target. We provide sound legal, tax, accounting, and financial advice to help fulfill your goals.



Deal closing and integration

Deal-making is hard. Integration is even harder. We support you in capturing more value by planning for integration early on in the process.



Post-merger integration

We help clients from concept through execution. Our Integration services include everything from synergy realization to change management.



Carve-out and separation

Having a solid plan and approach is critical. We support you in designing agreements, deal and tax structuring and quantifying key value levers.

Cultivating growth

Worldwide, Deloitte is regarded as among the best of all firms at delivering value-creating innovation.

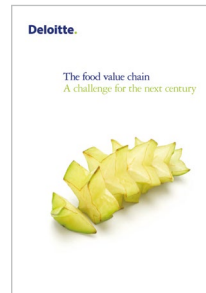
Deloitte is seen as better at helping clients reduce costs, improve operational efficiency and identify and implement options for growth. Additionally, it is perceived as better at helping clients expand into new markets or geographies.

Monitor Deloitte industry expertise

Our deep industry understanding and our Thought Leadership in AgriScience enable us to successfully address your strategic needs



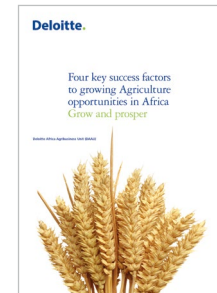
Building Partnerships for Sustainable Agriculture and Food Security
World Economic Forum in Collaboration with Deloitte (led by Shay Eliaz)



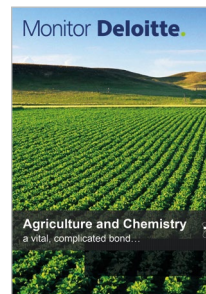
The food value chain, a challenge for the next century



Agribusiness Outlook 2015



Deloitte Africa Agribusiness Unit - Prosper and Grow



Agriculture and Chemistry – a vital, complicated bond



From Dirt to Data - The second green revolution and the Internet of Things



A capabilities-based approach to productive and innovative R&D

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