

**FOOD & BEVERAGE
COMPANIES
SECURING
THE SUPPLY CHAIN**



**CREATING TRUE COLLABORATION
WITH SMALLHOLDER FARMERS**



Table of Contents

The Problem - Smallholder Farmers Cannot Reach Their Potential.....	3
Taking Stock of Today's Untenable Situation.....	4
Reinforcing Synergies to Achieve Sustainable Agriculture.....	8
Applying Digital Transformation to Farming.....	10
Case Study: Heineken Extends a Helping Hand to Its Farmers.....	11
The Long-run Benefits of Comprehensive Data Sharing.....	12
Case Study: Tackling Pests At Source: The Case of Fall Armyworm.....	15
Agronomic Intelligence: Powering true collaboration with farmers.....	18
Moving Forward.....	20
F&Bs and Smallholder Farmers - Driving Sustainable Agriculture Together.....	21
Sharing the Profits of Growth.....	22



Many staples of the Western diet - coffee, tea, and chocolate - are grown by farmers with limited financial means. Some may have only a rudimentary education. This makes it difficult for them to truly benefit from the explosion of agricultural technologies.

Combining the know-how of the large corporations with the skills of on-site farmers will revolutionize the way we grow food. By taking an active role, Food & Beverage companies can bring advances directly to the farmers, benefiting every player in the supply chain.

F&Bs can grow ROI and reduce risk by increasing collaboration with smallholder farmers.



THE PROBLEM - SMALLHOLDER FARMERS CANNOT REACH THEIR POTENTIAL

Around **570 million** small family farms operate 75% of the agricultural land worldwide. When these farms underperform, they adversely impact the global F&B supply chain.

Challenges beset smallholder farmers. Climate change, soil degradation, and water shortages, make farming ever more unpredictable. Just as digital transformation is empowering other industries, it is slowly but surely doing the same for agriculture – but there is a lag.

Despite recent advances in agricultural technology, we are not seeing the impact – most smallholder farmers don't have the same access as large agribusinesses. If they had access to tools that measure and monitor soil erosion, assess field moisture levels, remotely monitor growth, and analyze crop health, they could use the data to better predict and improve yields.

Smallholder farmers..., who collectively supply most of the population's food, are incredibly resourceful in the face of challenges but need new options for sustainably producing and selling a wide array of crop and livestock products, especially as climate change rapidly intensifies the stresses they face

[The Gates Foundation](#)



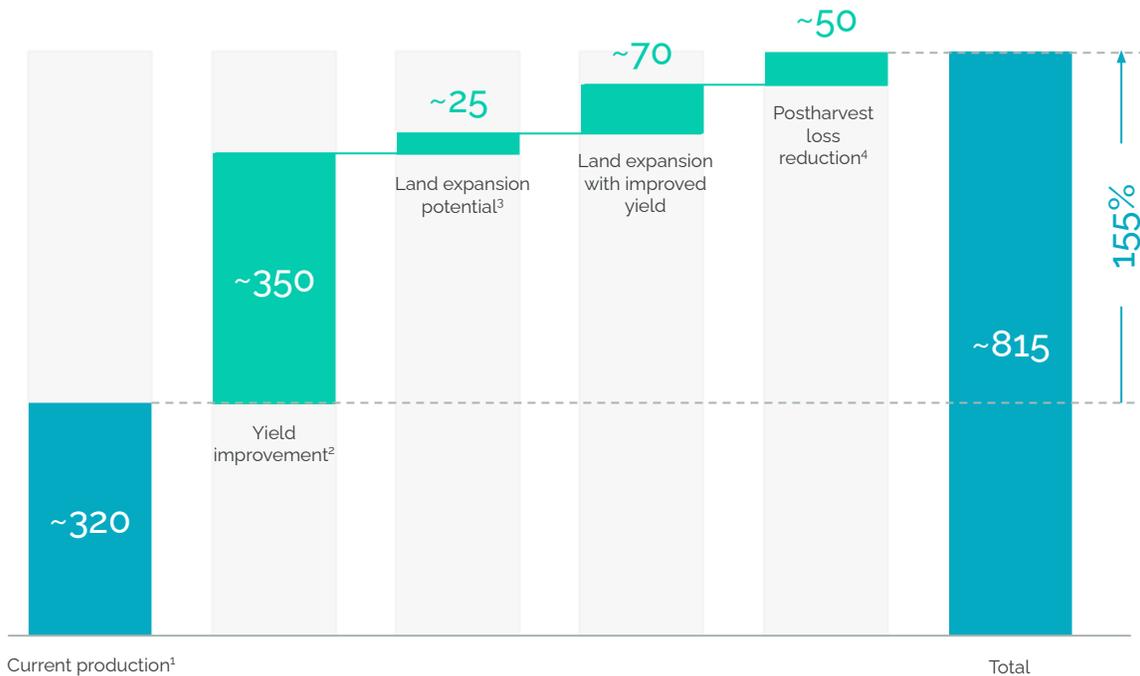
A [McKinsey study](#) of a group of sub-Saharan African farmers unveiled a significant yield gap between the potential of smallholder farms and their actual yield. Analysts calculated that given the right tools, these farmers could double their grain yield without needing to increase the area of land they were farming on.

Africa could be two to three times more productive if it intensified its agricultural productivity

Cereal and coarse-grain production potential, Africa, millions of tons¹

Many elements of traditional farmer knowledge that, enriched by the latest scientific knowledge, can support productive food systems

[UN Sustainable Development Goals](#)



¹ Cereal and coarse-grain production in 2014, from FAOSTAT (latest year available).

² Economic-yield improvements without irrigation for main cereal crops for sub-Saharan Africa only, excluding South Africa; some discounts made for less "commercializable" crops, such as sorghum and millet; based on Global Yield Gap Atlas.

³ Assumes 20-million-hectare land-expansion growth, based on McKinsey analysis.

⁴ Based on sub-Saharan Africa from 14% agricultural and postharvest loss to 10% (Latin America benchmark).



This is a global situation, affecting diverse farms growing an enormous variety of crops. F&Bs are already pouring money and resources into agronomic research and the quest for farming best practices. Their efforts are not having a direct impact on smallholder farmers as much as they could because of their lack of access to technology, skills, and education.

Furthermore, due to the farmers' technological access deficits and limited resources for onsite visits, F&Bs spend the growing season "in the dark." They have barely any knowledge of what occurs during the growing season, beyond what their field agents and farmers find time to report.

It's time to bridge the gap, to bring the benefits of technology to farmers in ways they can digest while providing F&Bs with the visibility they need to help. This combination will allow corporations to reap the full benefits of their investments while helping them create more collaborative relationships with farmers.

Farmers may have to endure a steep learning curve to truly master the technology they are being offered, but with the support of the F&Bs, they will quickly see the results. Increased efficiency, higher yields, better quality crops, lowered production costs, less unpredictability, and, of course, greater profits will incentivize them to keep learning how to master these tools.

It's time to explore sustainable ways to make food production more efficient, scalable, and less wasteful.



A single source of data between the smallholder farmers, suppliers and F&Bs allows F&Bs to provide guidance at the farm level while being able to make better decisions around supply chain forecasting and planning.



TAKING STOCK OF TODAY'S UNTENABLE SITUATION

Most F&Bs can and want to help. In fact, most large food industry players invest millions into agronomic research. They pour resources into digital innovation and R&D and employ their own agronomists to research the major issues in food production and devise best practices. Even with all this research, development, and investment, we are not seeing hard-core results in the field because of the following challenges:

Lack of Data

Currently, most agronomic data is collected on paper using techniques that result in inaccurate information. This creates a second-level problem – establishing a baseline. It is impossible to fix a problem without knowing the full extent of “who grows what, where, when, and how.”

Without access to correct field data, F&Bs are very limited in how they can help farmers. They may have developed best practices for maximizing crop yield in drought conditions, but without a constant stream of information regarding farm moisture levels, they can't advise farmers about what to do.

Furthermore, the farmer can only do so much. Farmers just don't have the time or ability to record all the meaningful data that impacts productivity.

To be sustainable, agriculture must meet the needs of present and future generations, while ensuring profitability, environmental health, and social and economic equity

[Food & Agriculture Organization of the United Nations](#)





Communication barriers

Lack of a common language, educational differences, and geographic distance make it very hard for corporate agronomists, supply chain managers, and other farmer-focused teams of the F&B to communicate with farmers and help them in a meaningful way.

In most cases, between pre-season planning and contracting through harvest and delivery time, manufacturers and other stakeholders in the agri-food supply chain have limited to no contact with farmers. In the best-case scenario, F&Bs may have some access to field scouts or limited engagements with growers. This means that throughout the entire growing season, most F&Bs have minimal visibility into what is actually happening in the field, despite this information being crucial to their production planning.

Technological access

While tools and solutions that could streamline and upgrade every step of the agri-food chain already exist, they are not widely available to the growers who need them most. The power to change this lies in the hands of the large corporations who have the resources to bring the technologies and skills to assist farmers' endeavors.



Food & Beverage companies can bring advances directly to the farmers, benefiting every player in the supply chain.





REINFORCING SYNERGIES TO ACHIEVE SUSTAINABLE AGRICULTURE

Comprehensive Data Sharing:

With a unified mobile app, farmers can readily report data from the field so that F&B agronomists can provide meaningful assistance and advice for problem remediation.

Local suppliers and scouts can also be utilized to collaborate with farmers and bring in more data from the field. This can tremendously help farmers ramp up on technology and report more structured and comprehensive data.

Eliminate Communications Barriers:

Sharing access within a single data-led platform strengthens collaboration, as both the farmers and F&Bs can use the data as the basis for discussion about new farming techniques, technologies, and practices.

The combination of these achievements reinforces their ability to achieve **Sustainable Agriculture**, ensuring soil health, reducing the use of pesticides and water, and increasing yields and profits for both smallholder farmers and the F&Bs.





APPLYING DIGITAL TRANSFORMATION TO FARMING

One of the ways out of this unworkable situation lies in the intelligent deployment of technology. With greater connectivity, IoT advances, and more affordable mobile devices, it has become easier to capture data from remote smallholder farms.

Using a combination of field data reporting, sensors and a finely tuned agronomic platform can create a true learning environment for the farmers and global food manufacturers alike.

The sensors can be placed in critical locations across the farm environment, collecting data about moisture, temperature, soil, fertilizer usage, and more. They can be reinforced with GPS and automated, regularly scheduled photographs of crop development.

Once all the data has been collected, it can be transmitted using Wi-Fi, mobile, or even satellite technology to a cloud-based data store. The data can then be integrated into an agronomic intelligence platform to provide comprehensive analysis as well as individual crop progress.

Farmer autonomy is critical to a smooth working relationship, so the ideal technologies would allow farmers to collect the data more easily, receiving immediately actionable insights that improve their own yields and profitability, beyond what the F&B can provide them – while still reinforcing the F&Bs' goal of having a steady, high-yielding, economical supply chain.

Ultimately, the same data would be used for agronomic decision support systems in which F&B analysts can create and use custom-built models, so they can share insights with the individual smallholder farms to improve their practices overall.



Public-private partnerships done right are a powerful tool for development, providing enduring solutions to some of our greatest challenges.

[USAID](#)





Case Study:

HEINEKEN EXTENDS A HELPING HAND TO ITS FARMERS

Heineken works very closely with suppliers and growers to develop farming best practices and improve the livelihoods of their farmers. Heineken wanted to improve traceability and visibility into their sourcing operations and increase their engagement with growers to provide everyone with timely and accurate information for better decision-making and optimized operations.

Customized Technology to Fit the Job

They have provided their farmers with Agritask's easy-to-use mobile solution so growers and local suppliers can communicate with Heineken from the field. It includes a web-based user interface for Heineken's staff to receive aggregated, actionable information in real-time.





The app combines data from a multitude of sources:

-  **Monitoring:** field activities, farm inputs, and costs throughout the season: planting, fertilization, irrigation, pests, disease, weed control, and harvest
-  **Satellite-based monitoring:** Remote sensing of crop health and water stress, which provide benchmarks and generate alerts about irregularities
-  **Weather forecasting and alerts based on virtual weather stations**
-  **Harvest delivery:** growers can request harvest delivery digitally, automating the processing and approval process for Heineken
-  **Post-season evaluation:** Associates performance metrics with plot activities throughout the season including a benchmark for better guidance

The Results

The solution was successfully deployed across two regions of more than 6000+ hectares, leading to farmers' optimizing processes, improved crop quality, and increased grower profitability.



THE LONG-RUN BENEFITS OF COMPREHENSIVE DATA SHARING

Implementing advanced technologies with shared data stores keeps strong lines of communication open throughout the entirety of the season as well as post harvest, significantly improving the relationship between the farmer suppliers and the F&Bs.

The data can be used to predict and track production over time, allowing F&Bs to have a much better sense of what inputs they will receive, both the timing and quality. This will lead to better planning and unification across the entire supply chain.

If yields are going to be lower than initially planned or of poorer quality, F&Bs will know about it much sooner, so they have enough time to make alternative arrangements and keep their commitments to those further down the chain. At the same time, they can guide the farmers, providing relevant advice that may help address the lower yield or quality issues in real time.

Furthermore, the combination of data and analyses regarding inputs and outputs gives a much clearer picture of the cost of production, allowing both the smallholder farmers and the F&Bs to maximize the value of their mutually beneficial relationship – ensuring a fair price for both the seller and the buyer.





TACKLING PESTS AT SOURCE: THE CASE OF FALL ARMYWORM

Fall armyworm is a ubiquitous, invasive pest posing a significant threat to global food security. Until recently, no feasible way existed for smallholder farmers to report data about potential infestations to the F&Bs - who have pest-fighting expertise to share.

Agritask's pest-control reporting app allows farmers and field scouts to easily report fall armyworm and crop data. The app supports multiple data reporting options, including photos and geo-referencing. Farmers without smartphones can report the pests to a local call center.

Farmers and F&Bs can both access the data, allowing F&Bs to rapidly provide assistance at the farm level while being able to make better decisions around supply chain forecasting and planning.

Furthermore, a unified data system allows F&Bs to have a bigger regional picture. This can be crucial for such issues as slowing the spread of infestation. Therefore, they can quickly work with non-infested farmers on preventative measures to ensure the pests don't reach their crops.





THE BENEFITS OF AN AGRONOMIC INTELLIGENCE PLATFORM

Creating and sharing a comprehensive digital infrastructure is the first step to collaboration. It's the best way for farmers to share information with F&B managers who may be thousands of miles away. It's a way for F&Bs to better know their growers, making it much easier to monitor their entire supply chain – they have up-to-the-minute information about exactly who is growing what crops in what locations and during which season.

To deal with the complicated and physically distant relationship among farmers and F&Bs, the best solution is a complete, comprehensive agronomic intelligence platform. Such a platform combines data collection, analysis, and communication, paving the way for smoother relationships and much more efficient processes along the supply chain.

Ideally, it provides profitable insights for both the F&Bs and farmers, giving F&Bs the visibility they need to provide the right guidance as well as better plan and predict their supply chain and farmers the ability to easily track the results of improvements in their growing practices.

Sharing data keeps the lines of communication open throughout the growing season, strengthening the relationship between smallholder farmers and F&Bs.





MOVING FORWARD

Experts predict that the global food supply needs to [double by 2050](#). To achieve this target, the time is ripe to explore sustainable ways to make food production more efficient, scalable, and less wasteful. Technology holds the key; to achieve its full potential in the field of agriculture requires one simple thing – access.

With F&Bs taking the lead on agtech investment, they'll create a mutually beneficial situation for all parties – smallholder farms will have access to technologies that they were either not aware of or were beyond their budgets.

This is an exciting time for Food and Beverage companies and other large corporations who invest in agronomic research and agtech. By stepping up collaboration with local growers, both farmers and corporations will become more efficient, stable, and profitable. With access to cutting-edge data, it's easier to share knowledge between F&Bs and their farmers, increasing yields while minimizing environmental impact.





F&Bs AND SMALLHOLDER FARMERS – DRIVING SUSTAINABLE AGRICULTURE TOGETHER



Nestle

Nestle plans to spend CHF 1.2 billion by 2025 to build regenerative agriculture practices.



Barry Callebaut

The company's "Prospering Farmers" project aims to lift 500,000 cocoa farmers in their supply chain out of poverty by 2025. Through the project, more than 50,000 farmers have been given access to coaching, inputs, tools, seedlings, and finance.



Mondelez

Mondelēz International is investing in a Global Center for Sustainable Cocoa Farming Solutions. The center, based in Indonesia, will focus on cocoa-crop R&D to support sustainable, scalable cocoa farming practices impacting hundreds of thousands of farmers globally.



Starbucks

As Part of Starbucks' Global Farmer Fund, including a \$50M commitment to provide financing to coffee farmers, the company has donated 30 million trees to coffee farmers, aiming to quadruple this to 100 million trees by 2025.



PepsiCo

As threats from climate change mount, PepsiCo launched an agriculture strategy focusing on regenerative farming practices and empowering farming communities.



The way to make this happen is by harnessing the right technology the right way. A simple-to-use agronomic platform is less intimidating for farmers than many other forms of technology. More importantly, it offers a practical and workable way for farmers to share information, collaborate with corporations, and unify data collated from various sources.

By enhancing visibility, it paves the way for agronomists and food scientists to have meaningful impacts at the farmer level. The end result is that everyone in the supply chain wins – from farmer to consumer.

Are you ready for the future of food production?

As threats from climate change mount, PepsiCo has launched an agriculture strategy focusing on regenerative farming practices and empowering farming communities.



SHARING THE PROFITS OF GROWTH

Agritask is focused on collaboration, delivering a unified platform with tailored insights for both farmers and F&Bs. The multi-perspective, single system delivers:



Supply chain visibility

Access to real-time data from the farms themselves will help F&Bs optimize and better predict yields and costs.



Standards & traceability

Makes it easier to implement and track best practices and quality control across all farm locations and easily ensure regulatory compliance.

The digital revolution has enormous potential for transforming the agriculture and food system in ways not previously seen - by drastically lowering information asymmetries and transaction costs that plague the system, and as a result, improving the lives of farmers, as well as the nearly 8 billion people who depend on them for food

[Kateryna Schroeder](#),
Agriculture Economist at the
World Bank



Make fact-based, on-time decisions

Digitizing field operations to gain a holistic view of all data in real-time allows growers to set up automatic alerts and improve response times. It also allows agronomists to share actionable insights more easily.



Better communication with growers and suppliers

F&Bs will be able to tailor advice based on real-time information from the fields.



Manage resources

Farmers can plan field activities and follow up on execution, monitor the productivity of workers, machinery, and materials, and implement best practices with embedded decision support models and actionable insights from F&B agronomists using their crop data.



Boost performance

Farmers and corporations will have the data they need to benchmark performance across different parameters, verify working assumptions with facts, and calibrate models across seasons.



AGRITASK F&B SOLUTIONS

PREDICTABLE, SUSTAINABLE

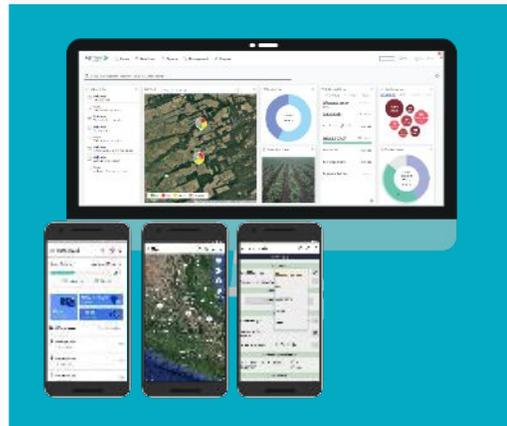
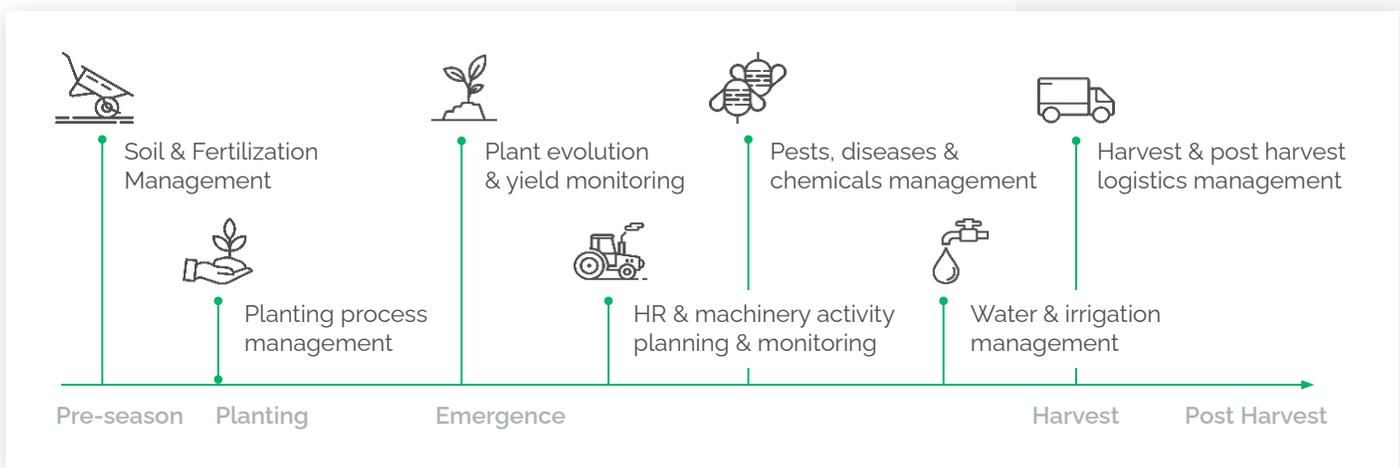
AGRI-FOOD SUPPLY CHAINS

Agronomic Intelligence at your fingertips

Agritask is an open Agronomic Intelligence (AgI) Platform, powering solutions for key challenges facing farmers, food companies and additional players in the agriculture ecosystem. Our solutions provide crucial agronomic insights to optimize operations across the food value chain and ensure sustainable farming and sourcing practices.

Agritask integrates a wide array of data, including its proprietary flexible mobile application, remote sensing solutions, and 3rd party systems and technologies. It then aggregates and processes data to provide actionable insights, underpinned by strong GIS and business intelligence capabilities.

Full visibility into grower operations: From sowing-to-harvest, from farm-to-factory





AGRITASK SOLUTIONS FOR FOOD & BEVERAGE – KEY BENEFITS

Supply Chain Predictability

Full visibility into grower operations to monitor growth, yields and quality from sowing to harvest

- GIS-based farms and fields registration
- Remote sensing via NDVI satellite imagery
- Local weather conditions, forecast and history
- Pest management and growth monitoring via digital scouting
- Yield forecasting

Engaging Growers

A full range of data and mobile tools enabling remote monitoring and real-time guidance, optimizing farming practices and helping farmers increase production

- Tailored management screens and dashboards for every farmer
- Real-time alerts, automatic reports and benchmarking
- Access to corporate best practices and recommendations: scouting, irrigation, spraying
- Cost-of-production per farm

Promoting and Ensuring Sustainable Practices

Setting, documenting, monitoring and improving on sustainability KPIs and Certification standards.

- Support for 4C, Rainforest Alliance, GLOBAL G.A.P and more
- A wide range of additional sustainability certifications
- Soil quality monitoring and treatment recommendations to growers
- Optimized Irrigation Management – reduced water consumption
- Carbon Footprint Calculator

