

Can the digital revolution transform agriculture?

By [Heinz Strubenhoff](#) and [Roy Parizat](#)

8 Mar 2018

The world talks a lot about the digital revolution, but few connect it to the coming agriculture revolution, especially in Africa. Digital solutions have huge potential for helping farmers boost productivity and connect to financial tools and markets around the world.



lqlqlq75 via [pixabay](#)

Farming in the plains of northern Nigeria around Abuja requires tedious manual labour because of the lack of farm machinery. A few days of tractor use for farmers in this region could improve productivity by 20 to 40 times. However, farmers cannot afford to buy a tractor in remote rural areas of Africa.

Jehiel Oliver, founder of Hello Tractor, thought that an [Uber-like tractor service](#) might be a solution. “Our booking system allows farmers to conveniently request, schedule, and prepay for tractor services from nearby smart tractor owners, through text messaging and mobile money. Once service is completed, the prepayment is automatically released to the smart tractor owner,” explains Oliver. His smart two-wheel tractors are equipped with GPS antennae that collect and transfer necessary data. The system helps to reduce tractor costs, raising farm productivity and generates additional income.

These types of innovations have the potential to affect developed countries. Whereas the number of tractors in Nigeria may be insufficient, Switzerland and Germany have a luxury problem: too many under-used tractors. But in cases of both over and undersupply, tractor (and car) use could be greatly [optimised using digital services](#).

Figure 1: Number of tractors per 10,000 hectare of arable land (2007)

Nigeria	7
United States	276
Switzerland	2,611

Source: FAO

Digital exchange of services the core innovation

The core innovation for farmers is that services and money can now be exchanged digitally, a revolution that has been

spearheaded in Kenya with mobile money platforms like M-Pesa. Mobile money has been so successfully introduced that there is more money on mobile phones today than in the whole banking system of the country with a [quarterly volume of \\$10bn and 20 million subscribers](#). M-Pesa enables its users to deposit and withdraw money, and transfer money to other users, for example, like agri-input dealers. With 3.5 billion cell phones currently in the world, these services have quickly disseminated to other countries.

In Australia, farmers are herding cattle via cell phones. Boundaries are enforced by electrical prompts from transponders on individual cattle collars. The signal comes from a farm base station linked to GPS tracking. Grazing zones can be enabled and controlled by an app. It's easy to imagine how this technology greatly [reduces labour and material costs of cattle herding](#).

The [digital revolution could also improve the lives of farmers and consumers](#), especially in reducing wasted time and resources while enhancing productivity. People in rural areas who previously were not able to access banks can now make and received [money transfers at low costs](#).

There are more benefits. Technology may greatly improve food safety in value chains. For instance, consumers in China do not trust domestic food producers. Too many food scandals in the past have undermined consumers' trust. That's why IBM, Walmart, and the Chinese retailer JD.com together with Tsinghua University have announced a [blockchain food safety alliance](#) to improve food tracking and safety in China. Decentralised ledger technology can trace back the origin of food products in a few seconds instead of a few weeks, making it easier to combat fraud.

Changing the current agribusiness model

Combining big data and digital technology will change the way of doing agribusiness. In the past, suppliers of fertilisers, plant protection products, agriculture machinery, and seeds aimed to increase sales. Changing consumption patterns (25% of Europeans are vegan sympathetic and reduce animal protein in their diets) and declining population growth will most likely [change the current business model of global agribusiness](#). "Before, selling more products meant more business for a company like Bayer; whereas in future, the fewer products we sell the better because we're selling outcome-based services. With sensor devices, we can learn a lot more about what is and is not helping crops and livestock and create a better way of doing things," says Tobias Menne, head of Bayer's Digital Farming.

Ultimately, farmers need the most appropriate fertilisers and plant protection products for their location. This mandates the existence of local agri-input dealers who can reach farmers and provide advice and input tailored to farmer needs in partnership with global players. The [Farm Shop franchising network in Kenya](#), for example, now reaches small farmers who previously were challenged in securing appropriate advice and inputs.

Alex Lissitsa, CEO of IMC in Ukraine, is constantly testing and introducing digital solutions for the company's farming operations. He knows at any time where the agriculture machinery is working by using GPS-monitoring systems. IMC's agronomists steer drones over their fields to differentiate the use of seeds and fertilisers to the needs of specific tiny plots.

Less is more

What's more, less input and higher productivity solutions like these will make farming climate smarter. About 24% of carbon emission equivalents come from agriculture. Digital solutions and big data may enable climate funds to invest in small, remote, and disconnected smallholders applying climate-smart farm and irrigation practices to mitigate and adapt to climate change.

Finally, governments can improve farming scientific research and education. Artificial intelligence, like chatbots, may greatly improve and reduce the costs of educating and informing farmers. Farmers may be able to quickly get practical answers to questions, for example, about animal diseases, animal health, and vaccination in livestock production, and crop diseases, plant protection, and optimal seeding and harvest times in crop production. Even subsidies may be distributed better with less costs and risks of misuse.

While these innovations only scratch the surface of the coming digital revolution, it's clear that digital solutions will transform agriculture with great benefits for smallholders.

Source: [*Brookings*](#)

For more, visit: <https://www.bizcommunity.com>