



THE DIGITAL TRANSFORMATION OF AGRICULTURE AND FOOD SYSTEMS

Highlights

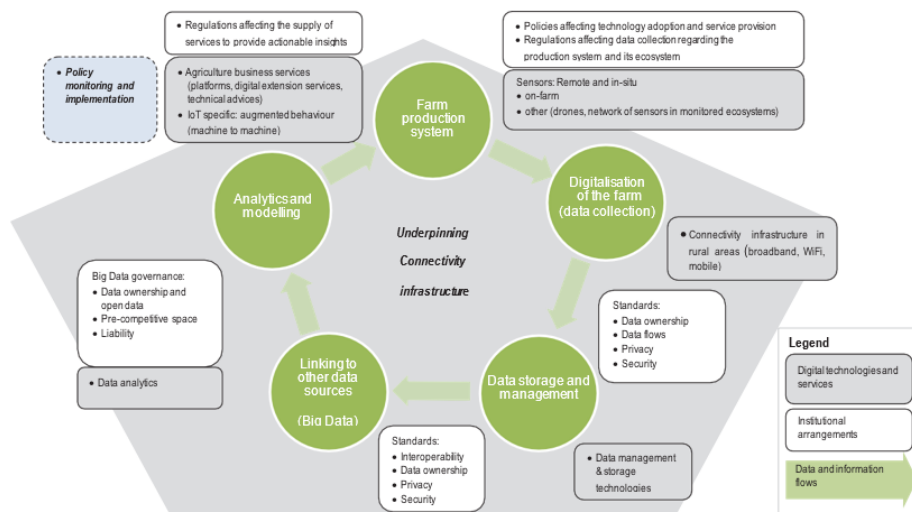
- Digital technologies provide new opportunities to farmers, supply chain actors, including consumers, and policy makers to improve the productivity, sustainability, and resilience of food systems.
- Policy makers can use digital technologies to improve the design and implementation of agriculture policies, leading to better targeting and greater efficiency.
- Digital technologies can facilitate trade through more efficient customs management and risk assessments, as well as by improving trade logistics and enabling digital SPS systems.
- The digital transformation of agriculture and food systems also raises important policy questions, for example regarding connectivity, interoperability and infrastructure, as well as governance issues related to data ownership and control.

What’s the issue?

The digital transformation of agriculture and food systems creates new opportunities for the sector to create value added, facilitate trade, satisfy consumer demand and improve policies. Digital technology is an enabler of innovation. From low-tech approaches using mobile phones to high-tech “digital farms” integrating input from drones, the digital transformation is helping farmers become more productive, sustainable and resilient. It is also facilitating international trade by streamlining customs management, risk assessment and logistics (e.g. by using digital technologies in Sanitary and Phytosanitary (SPS) systems). Digital tools can connect farmers with consumers, potentially unlocking additional income and new sources of value added. Policy makers can use digital tools to create more targeted and more efficient policies with lower compliance costs.

At the heart of this digital transformation is “datafication” – the process of transforming information into machine-readable data. In recent years, the agriculture sector has become an increasingly important consumer and supplier of data, potentially across borders, enabling value creation both upstream and downstream of the farm. Upstream of the farm, this includes providing new customized services, e.g. farm-tailored advice using analysis of on-farm data. Downstream, data from farms can feed into to the rest of the value chain (food processors, wholesalers, retailers, or government), e.g. for traceability or compliance with public and private standards.

Figure1. The digital transformation of agriculture and food systems



Source: OECD (2019), *Digital Opportunities for Better Agricultural Policies*, OECD Publishing, Paris.

The increasingly central role of data raises complex questions about data ownership, privacy, and security. Fully realising the potential of the digital transformation depends not only on access to basic connectivity infrastructure, but also on the development of data collection and analysis services, and on the regulatory environment. At a more basic level, many farmers are currently not participating due to high costs, insufficient user-friendliness, a lack of skills, technological risks or mistrust (e.g. because of concerns around data privacy, a perception of bundled technologies as a “black box”, or a lack of clear standards).

The OECD has explored the opportunities and challenges offered by digital technologies for both governments and actors in agro-food value chains (Figure 1 above). The example of digital opportunities for improving farm management helps to identify key technology and policy requirements. At each stage of the cycle, policy and regulatory environments (or the lack thereof) influence the extent to which digital tools are available to stakeholders, as well as how the resulting value added is distributed.

What should policy makers do?

Broadly speaking, policy makers face two main tasks. One is to provide the necessary infrastructure and enabling policy and regulatory environment to make sure agro-food actors can reap the benefits of the digital transformation of agriculture. Another is to partner with the private sector to make optimal use of digital technologies in the design and implementation of policies.

To stimulate the digital transformation of agriculture and food systems, governments should:

- support connectivity and improved data collection and the development of a data infrastructure, including the cross-border dimension;
- develop standards for quality data, algorithms and the evaluation of devices;
- champion efforts to improve access to agricultural data (both for research and the provision of services to farmers), including the promotion of digital skills;
- support dialogue between stakeholders to address the issues of control, use and sharing of data in agriculture and food systems. Attention should be given here to the specificities of agricultural data, which can be seen in many cases as a private asset or a public good.

In embracing the use of digital technologies for the improved design and implementation of policies, governments should:

- re-evaluate policies and systems, rather than simply mimicking current activities in a digital format;
- make use of digital technologies to improve agriculture and trade policies and enable new types of measures (e.g. policies that are more results-based, more collaborative, or less compliance-driven);
- address challenges they face in adopting digital technologies, including institutional constraints, and transparency, oversight and responsibility;
- avoid new digital divides through accompanying measures to ensure equal access to technologies.

Further reading

Jouanjean, M. (2019), "Digital Opportunities for Trade in the Agriculture and Food Sectors", *OECD Food, Agriculture and Fisheries Papers*, No. 122, OECD Publishing, Paris, <https://doi.org/10.1787/91c40e07-en>

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