



AFRICAN CENTRE  
FOR BIODIVERSITY

# Rise of the digital economy in Africa

Africa is being viewed as a 'new frontier' for digital products and services. In this fact sheet we unpack some of the key concepts and issues relating to the rise of the digital economy in African agriculture.

FACT SHEET

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## What is the digital economy?

The digital economy is anchored in digital technologies – internet, mobile devices, big data, artificial intelligence (AI), robotics, and cloud computing – to support and facilitate interactions and transactions among people, organisations, and countries. It has supplanted the traditional ways of doing business by replacing real-world products and services with digital counterparts, and in so doing, bypassing service providers such as banks or travel agencies, and changing the way that we buy, access, and use products.

Digitalisation of the economy could exacerbate unemployment on the African continent. This is because the existing digital sector (telecoms and mobile money sectors, for example) is not big enough to absorb the “29 million youth who will turn 16 years old every year between now and 2030” (AUC/OECD, 2021:24). The 2021 African Union Commission and Organisation for Economic Development Report notes that governments need to promote the dissemination of digital innovations through place-based policies to ensure universal access, put education and training in place to enable Africa’s workforce to enter this sector and provide social protection for those that can’t, provide support for small to medium-sized enterprises (SMEs) to benefit from new innovations and work collaboratively across the continent to support a digital transformation, for all.

Data has become a new global commodity. Actors in this space are drawn from a wide range of fields – agri-food corporations, technology companies, the financial sector, agricultural technology companies, governments, and international institutions (Canfield & Montenegro, 2023). These players fiercely compete with each other, to “generate new economic value from data and data infrastructures” (Canfield & Montenegro, 2023).

## What is data?

The United Nations Committee on World Food Security (CFS) defines data as “any set of codified symbols representing units of information regarding specific aspects of the world that can be captured or generated, recorded, stored, and transmitted in analog or digital form” (Civil Society and Indigenous Peoples’ Mechanism [CSIPM], 2023:1). While data is valuable in its singular form, it is significantly more valuable in aggregated form – when data on a specific topic are grouped together.

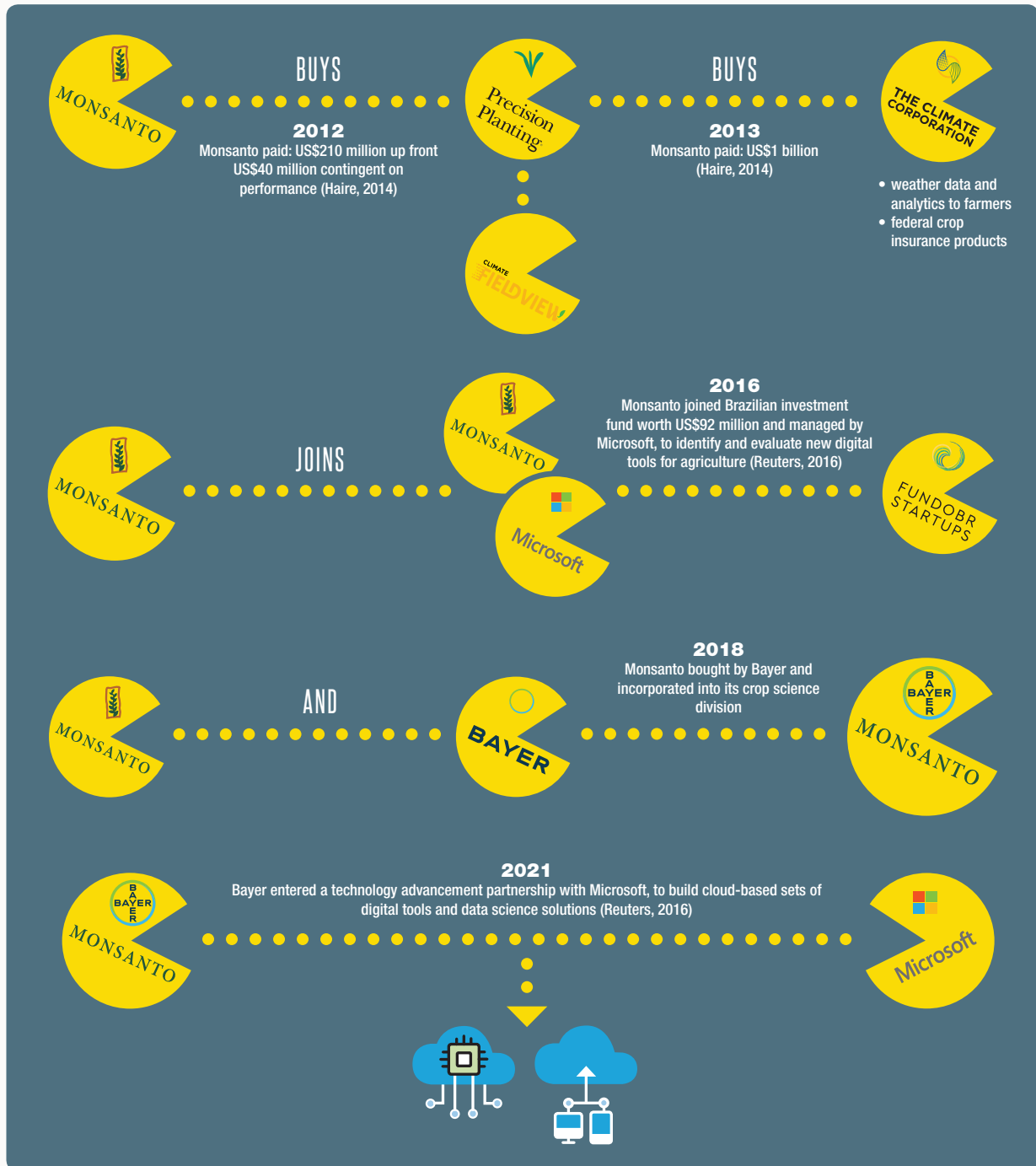
## What is agricultural data/data in food and farming systems?

Data related to food and farming systems include information about people (demographics, consumption behaviour, and nutrition and health indicators); production and distribution approaches and practices, and food system elements (seeds, genes, livestock, land, and weather, as examples) (CSIPM, 2023). It includes information about soil moisture, the carbon content of soils, genetic/biological data (plants and livestock), pest and disease outbreaks, production patterns, yields, use of inputs such as chemical pesticides and synthetic fertilisers, market size, etc. (Yi, 2021).

This data is gathered primarily by those companies that have a commercial interest in identifying gaps in current markets or in using the knowledge gained to create/enter markets (CSIPM, 2023). Data is collected from farmers via sensors, weather stations, drones, and satellites, among others, and is used in analysis and modeling to predict real-time yields and design carbon credit schemes, and commodity speculation and marketing. It is also used to influence policymaking.

# Digitalisation of agriculture and corporate control

Digitalisation of agriculture refers to inputs, production, distribution, marketing, and aggregation of farming data, including the collection of information to create datasets for the purpose of analysis. It is led by big technology companies (such as Google and Microsoft) and big agribusiness companies (like Syngenta and Bayer). There is enormous money to be made from both digital product development and the use of the data itself. Some of the many partnerships between agrochemical and tech companies that are taking place, include:







## Agricultural data and the digital economy

Agricultural data has become a new global commodity with multinational corporations competing, to generate new economic value from data infrastructure and the data gathered through it (Canfield & Montenegro, 2023). It is being touted as a silver bullet to address multiple crises in food and farming in Africa, and is reshaping our very perception of the food systems, through the inclusion or exclusion of ‘data that counts’ and therefore what food futures are imaginable” (CSIPM, 2023:1).

Partnerships have been formed between agri-chemical and technology companies to leverage the expertise of each other, in the rush to mine and thus own data/information that can be used to generate profits. An example is Bayer’s 2021 technology advancement partnership with Microsoft to build cloud-based sets of digital tools and data science solutions.

## What does blockchain refer to?

Blockchain in this context, refers to a series of digital packages – think of a folder on your computer as a ‘package’ containing information and these packages sit alongside each other to make an information ‘road’. Instead of these packages sitting next to each other along a normal road, they are held – but still linked – on many computers in a network. This can be a public network open to all who want to hold packages or it can be a private network in which a company determines who holds the packages. Each computer that is hosting a package is verifying the information captured in the package, including the time that it was received. This means that a transaction captured in all these packages is stored in a distributed network instead of a central place where it could be more easily ‘stolen’. Blockchain technology signals a shift from what was once a system with trusted intermediaries (banks, insurance companies, travel agents, etc.) to a trustless environment, where the need for trust is removed.

## What is AI machine learning?

This refers to a computer programme that is programmed to mimic human thinking in that it can use data/information to make a logical deduction on its own or advise on a course of action. The programming also includes a framework for machine learning, which enables the AI programme to teach itself. Note that the assumptions and values of people who design the AI computer programme can carry over into AI programming. The results of AI's outputs are therefore not necessarily objective.

## What is cloud computing?

This refers to information stored on the internet through a network of remote servers, rather than on your personal computer or a local server. Many products are now only available on the 'cloud', meaning you can only access the product (accounting, computing, and design software, for example) online, instead of buying the software on a disc.

## What are the implications for smallholder farmers in Africa?

The digitalisation of African food and farming systems, including the extraction and use of data, is taking place under circumstances where smallholder farmers are mere 'data producers.' This is enabling profiteering by private companies from the knowledge of farmers, their farms, territories, and the relationships they enjoy with the land and resources (Canfield & Montenegro, 2023).

What technological benefits will smallholder farmers derive, given that they live in rural areas with lower access and levels of digital skills? Pertinent to this discussion is the significant digital divide that exists in Africa, including across urban-rural locations and by gender, which is supported by disparate investments in digital infrastructure, including fixed broadband, internet connection networks, mobile networks, communication satellites, Wi-Fi networks, etc.

A 2022 review of digital agriculture in 27 African countries notes unequal access to electricity, high costs of internet-enabled mobile devices, and data as limiting factors (FAO & ITU, 2022). Thus, digitalisation of food and farming systems in Africa runs the real risk of not only entrenching existing inequalities (by being inaccessible or unaffordable to the rural poor) but also creating new forms of inequalities.

What about the protection of human rights and issues relating to accountability, transparency, conflicts of interest, and the need for data in food and farming to be considered a public good and not a proprietary product?

(CSIPM, 2023)





## What is digital sovereignty?

Digital sovereignty “seeks to restore digital independence and data control to government, and private individuals” (OoDrive, 2020:1). It focuses on a country’s degree of digital independence on foreign companies’ products and services. The primary drivers behind the call for digital sovereignty are the need to:

- Protect data privacy of individual and country-level data
- Retain a country or region’s ability to innovate (in a rapidly evolving digital sector)
- Influence and enforce legislation in a digital environment (European Parliament 2020)

## What are digital public goods?

Digital public goods (DPGs) are one way to address concerns about the colonisation of digital data by a few proprietary companies. They are open source, enable direct involvement, and the programming is publicly accessible (Nordhaug & Harris, 2021). In India, primary and secondary schools switched to open-source software, saving the state US\$1.3 billion (Nordhaug & Harris, 2021). More than 73 countries use District Health Information Software – first used in South Africa – to support the collation and analysis of national and regional health data (Nordhaug & Harris, 2021). All DPGs are independently audited and are verified against the ‘do-no-harm by design’ indicators of the DPG Standard, overseen by the Digital Public Goods Alliance (Nordhaug & Harris, 2021).

## Responsibilities of African governments

Digital agriculture is not addressed in national and regional agricultural policies. Digitalisation of Africa's food and farming systems is neither neutral nor objective in their design or deployment. Their introduction can disrupt traditional, often 'unseen' systems that establish social cohesion or environmental stewardship, because of its far-reaching impacts and consequences, including the potential to entrench and deepen existing inequalities or make new ones. There is a responsibility on African governments to ensure 'data justice' in which "individual privacy, community sovereignty, and human rights are the foundation" of how data collection is framed and how it is stored, distributed, and used (CSIPM, 2023).

Digital sovereignty must be considered thus in its broader aspects of ensuring digital (and not only data) independence. Governments must ensure the safety of national data (related to health, land, water, food, and farming systems, etc.) to protect citizens and national data privacy, taking into account also that most government data in Africa is currently stored on servers in foreign territories (Velleut, 2021).

Digitalisation is neither a replacement for equitable and transformative policymaking, nor is it a solution to hunger, poverty, and social and environmental justice. Rather, it is a tool that could support solving these challenges if brought under democratic control and adequately governed. African governments should ensure that the capturing of national-level foundational data is properly regulated, and that the privatisation of such data is disallowed. Farmers in the United States are particularly vocal in their concerns about how their data is being used and have fought for some protective measures to be put into place, including that agricultural technology contracts signed with agri-tech companies must expressly state that data will not be used for commodity speculation, among other provisions (Nordhaug & Harris, 2021).

Further to this, governments must not allow public funding to be directed towards creating the base from which propriety products can be created. Further to this, governments must ensure that processes in which data is used to inform policymaking or digitalisation of processes, such as land registries, are framed within a human rights framework.

African governments must ensure that digitalisation does not serve to further marginalise already vulnerable citizens and deepen inequalities. They must work quickly to ensure appropriate education and training systems are in place to enable entry into this sector and resolve the digital divide, particularly as regards spatial and gender bias. They must also ensure that those who will be displaced by a rush towards digitalisation are protected.

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